PAPERS OF THE
ROBERT S. PEABODY FOUNDATION
FOR ARCHAEOLOGY

VOLUME SEVEN

# THE CENTRAL PERUVIAN PREHISTORIC INTERACTION SPHERE

BY

RICHARD S. MACNEISH, THOMAS C. PATTERSON
AND DAVID L. BROWMAN

PHILLIPS ACADEMY – ANDOVER, MASSACHUSETTS
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# PREFACE

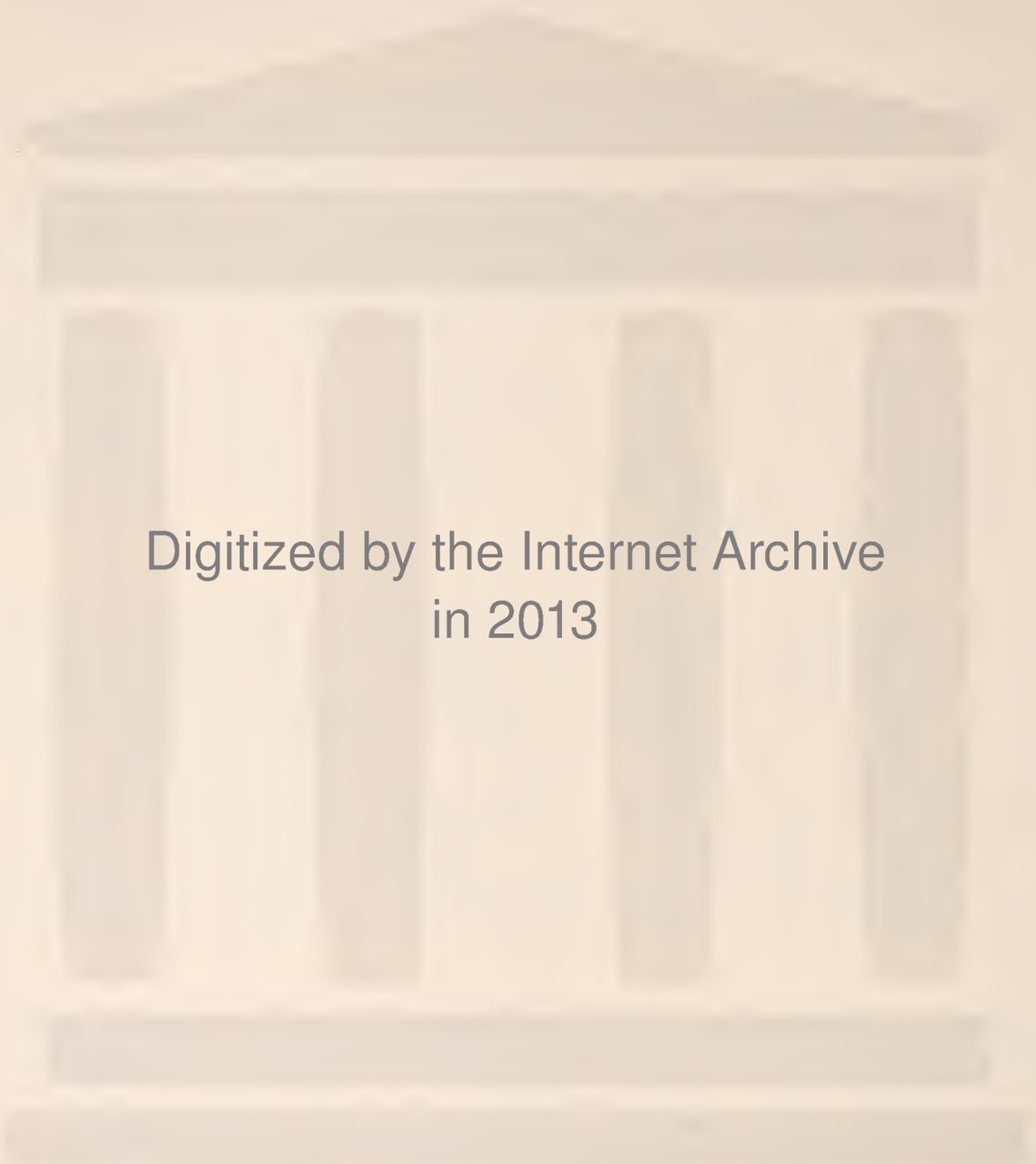
This paper started as an illustrated speech given by the senior author on "The Central Peruvian Preceramic Interaction Sphere" at the VIII International Congress of Protohistoric and Prehistoric Sciences, in Belgrade, Yugoslavia in September of 1971. It was heavily oriented to the theme of the origins and spread of agriculture in central Peru. It was about the right size for Science and the senior author thought it could serve as a third annual report of the Ayacucho Archaeological-Botanical Project, much like an earlier article entitled "Ancient Mesoamerican Civilization" done for the Tehuacan Archaeological-Botanical Project, in 1964.

However, the senior author felt somewhat insecure about some of the data from the central coast of Peru so he consulted with the second junior author, Thomas C. Patterson. The latter expanded the sections on the coastal preceramic and convinced the senior author that the early ceramic periods were also relevant to the problems of early agriculture. So, it was decided to rewrite the paper. Much of this was done by Patterson and when it was completed it included not only a new introduction but also a description of all the ceramic periods, including those of the highlands which had been investigated by the senior author. The manuscript was now about fifty pages too long for Science, but still could be printed as a third annual report by the Robert S. Peabody Foundation. However, neither of the authors was fully satisfied with it.

First, the Ayacucho ceramic materials based upon the excavations of the senior author's co-workers, Luis Lumbreras and Angel Garcia Cook, were not adequately covered and, second, recent investigations by a former student of Patterson's, David L. Browman, in the Huancayo upper Mantaro seemed very relevant and had not been included. Thus, it was decided to ask Browman to become a third author so that his important data could be included. Once again, the authors rewrote a steadily expanding manuscript. After a number of months it came out some ninety pages long (too big for an annual report), so now it would have to be published as a small book that still needed some adequate conclusions.

Finally, by the spring of 1974, Patterson and the senior author once again got together to finish this book and after an extended weekend of arguments and writing, except for further work on the conclusions by the senior author, this manuscript is the result. None of the authors is totally satisfied with the results, but all are losing their enthusiasm for this seemingly endless endeavor and all feel there is a considerable amount of worthwhile information that should be available to our colleagues. Further, if we continue as we have, none of it will ever be available in print! Thus, here it is.

RICHARD S. MACNEISH



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ACKNOWLEDGEMENTS

We would like to thank at the outset our hosts, the Peruvians, and not only just the officials but everybody Peruvian with whom we were in contact. We were shown every courtesy and helped out at every turn. Nevertheless, first and foremost, on an official level, we owe a great debt of gratitude to Herman Buse de la Guerra, presidente del Patronata Nacional de Arqueologia during the periods we were in the field, as well as to the then head of the Casa de Cultura of Peru, Dr. Cesar Miro; Dr. Arturo Jimenez Borja, then sub-director; and Dr. Carlos Guzman Ladron de Guevara, then director of the Monumentos Arqueologicos. We also would like to thank Luis Lumbreras and Ramiro Matos, members of the Patronata, in whose archaeological zone we worked, as well as Dr. Jorge Muelle C., then director of the Museo Nacional de Antropologia y Arqueologia, as well as his assistants, Antonio Espejo and Rogger Ravines.

The senior author, because he ran a somewhat larger interdisciplinary project for a longer period (1969-1972) in Ayacucho, is indebted to a number of other people. First, he would like to thank the National Science Foundation for its continued support of the Peruvian work, as well as Fred Johnson who was director of the Robert S. Peabody Foundation when the project started. Also, from the home office, thanks are owed to Theodora George who so successfully administered the project with the help of our field administrators, Gordon Hadden and Raquel Chocano-Bryce.

In the field in Ayacucho, the senior author would like to express his gratitude to the two who really ran the project--Antoinette Nelken-Terner of the C.N.R.S. of France and Angel Garcia Cook of the I.N.A.H. of Mexico. Fortunately, both of them were assisted by a host of students to whom we are grateful. This group would include: Robert Vierra, Wayne Wiersum, Augusto Cruzatt, Urve Linnamae, Dennis Price, Peter Jensen, Hernando Carillo, Willy Fajardo, Carlos Chahud, Ulpiano Quispe, Victor Cardenas, Edmundo Pinto, S. Cutacora, Victor Contreras, Freddy Ferrua, Alfredo Olivas, Oscar Parodi, Ernesto Saez, Rubin Quinde, Fermin Fivera, Idilio Santillana, Elia Vasquez, Juan Villa, Theodoro Espino, Fernando Arce, Lucho Greta, Eduardo Tello, Jaime Urrutia and Mario Vasquez. We also were very fortunate in having Dr. Luis Guillermo Lumbreras, then of the University of San Marcos and his students Berta Vargas, Rosa Mendoza, Fernandes and Marcela Rios Rodriguez work with us, as well as Luis Benevides of the University of Huamanga. It was a pleasure working with them and we were grateful for what they did for the project.

Beside these anthropological workers, the senior author would like to thank a host of other scientists who worked with our interdisciplinary project. These would include Dr. Barbara Pickersgill, a botanist from the University of Reading, England; Drs. Elizabeth Wing and Kent V. Flannery from the Florida State Museum and the University

of Michigan respectively; the physicists, Drs. Rainer Berger and Reiner Protsch of U.C.L.A., and James Buckley of Teledyne Isotopes; Inc., our geologist, Dr. Nathaniel Rutter of the Geological Survey of Canada; the botanists, Drs. Walton Galinat and Laurence Kaplan of the University of Massachusetts; as well as Dr. Thomas Whittaker, then of the U. S. Department of Agriculture; paleontologists, Dr. Grayson Meade then of the University of Calgary, Dr. Brian Patterson of Harvard University, and Dr. Robert Hoffstetter of the C.N.R.S. of France; and Dr. Vaughn Bryant of the University of Texas with his coprolite studies.

In conclusion, we would also like to pay special tribute to Dr. Eric O. Callen who died during the pursuit of his specialized studies in Ayacucho. We deeply regret that science has lost such a worthy contributor and that we have lost a friend.

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# CHAPTER I

## INTRODUCTION

Since the late 1940's archaeologists have usually dealt with long-term processes of socio-economic development in nuclear areas of civilization--like the Near East, Mesoamerica, and Peru--in terms of a sequence of cultural stages through which all of the inhabitants eventually passed at roughly the same time (Willey 1966). Previously it was thought that the earliest inhabitants of these areas were hunters and gatherers, suspiciously reminiscent of the Great Basin Shoshone described by Julian H. Steward, who eked out a living by hunting large game or by wandering from one place to another as the various seasonal food resources became available. Towards the end of this stage of cultural development, some of the inhabitants were already exploiting plants with the potential for domestication. It was speculated that eventually agriculture and animal husbandry were developed for various reasons and the inhabitants were no longer dependent on nature for their food. Therefore, since these food-producing activities required them to spend more time each year in one place than they had done previously, year-round settlements eventually emerged. As their numbers increased it was assumed that some of these settlements eventually grew into cities, markets developed, and social stratification appeared between different segments of the society as some individuals devoted their energies exclusively to food production and others to full-time craft specialities or to various political and religious activities. Presumably as the population expanded, increasingly elaborate water management systems were created to open up new farm lands to support the growing numbers of people. According to this argument, new levels of political control were devised as water became a more precious commodity and conflicts over its availability increased. As a result, states of varying size and duration developed in response to these conflicts, as the members of one community and then another imposed their wills on the peoples they conquered. In the New World, at least, this natural process of socio-economic development was brought to an end by European invasions during the first half of the sixteenth century.

In the early 1950's, because of the interest in cultural ecology, some noted that there was considerable ecological diversity in these nuclear areas of civilization and that the inhabitants of various regions might have had access to quite different kinds of resources (MacNeish 1954; Coe and Flannery 1964). The recognition of inter-regional differences led them to focus on symbiosis as a mechanism of cultural development in these areas (Sanders and Price 1968). Each environmental zone produced its own variety of goods, and the commodities of one zone were exchanged for those of another. Such exchanges were usually seen as taking place in some kind of market-ceremonial center, largely because of the emphasis that was placed on Near Eastern and Mesoamerican data in formulating this model (Braidwood and Willey 1962).

Further development of the regional interaction model was severely hindered by the lack of archaeological data. Thus, in order to overcome this limitation, some archaeologists combined data from relatively well-known regions with any information they had about the unknown regions to produce a single sequence of cultural development that was applicable in all of the various environmental zones of the nuclear area (Willey 1966). As data accumulated rapidly in various nuclear areas during the 1960's, it became increasingly apparent that the processes of socio-economic development occurring in radically different ecozones of the same nuclear area might be fundamentally different from each other.

For instance, many of the investigators of the Natufian villages in the Levant even into the mid-1960's firmly believed that evidence of agriculture would be found showing that this area developed like those of the hilly flanks of the Near East (Perrot 1962, Kenyon 1960; Braidwood 1968). However, Zeuner's opinion was that, "The economy of the PPNA settlement is only an intensified form of food collection in the Oasis and its peripheries" (Perrot 1962, p. 152). Later investigation by Perrot in other Natufian sites (Perrot 1966) and by Van Loon at Mureybit (Van Loon 1968) confirmed Zeuner's speculations. MacNeish in 1964 on the basis of large pre-ceramic villages without grinding stones found by Ford in Veracruz, and noting that the Brushes on the Guerrero coast also wrote that these marine villages did not have agriculture, although contemporaneous highland bands in Tehuacan and Tamaulipas had domesticated a host of plants at the same time, observed that these two separate developments were interstimulating each other (MacNeish 1966). Patterson and Lanning felt also that agriculture was intrusive into the marine-oriented way of life on the central coast of Peru (Patterson and Lanning 1964). So, short circuits were beginning to occur in the party line.

Until recently, it was not possible to verify these suspicions or hypotheses, because data from adjacent regions in the same nuclear area with significantly different ecologies were simply not available However, in the 1970's, as a result of intensive archaeological investigations carried out during the past years on the central coast, on the western slopes of the Andes, and in the upper and middle parts of the Mantaro Valley in the central highlands, a new concept has emerged.

Central Peru is an ecological mosaic composed of a number of different environmental zones. In fact, the area is one of the most environmentally diverse regions in the world where even a few hours' journey can take one through three or four very differnt environmental zones. Much of this diversity is patterned, however. Two important patterns exist. The first is a repetitive one consisting of a series of zones that repeat themselves every twenty to thirty kilometers. It is most apparent on the west side of the Andes, where fertile river valleys with abundant food resources are separated from each other by stretches of barren hills and desert. It also occurs

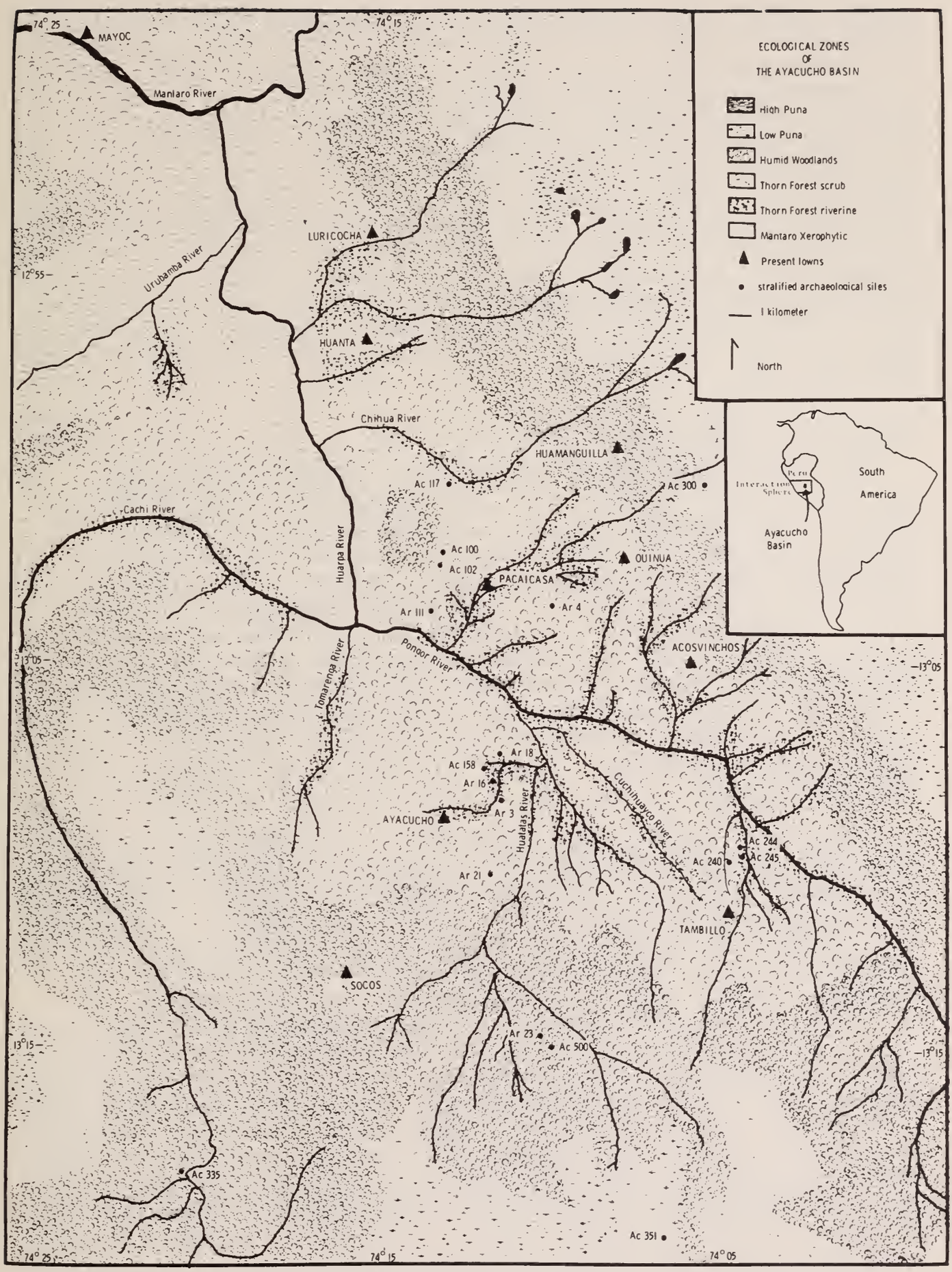



Figure 1. The major excavated archaeological sites in the ecological zones of the Ayacucho Basin - a typical highland zone of ecological diversity.

in the highlands, where river valleys at varying elevations are separated from each other by stretches of gently rolling puna grasslands and towering snow-covered peaks. The other pattern is a linear one consisting of a sequence of zones that never repeat themselves. Again, it is most apparent on the west side of the Andes because of the steep elevation gradients that occur there. Today, corn, cotton, and other crops requiring long growing seasons are planted at low elevations; potatoes and other root crops are planted above the 3,000 meter contour; and grazing lands occur at higher elevations where the number of frost-free days is too small to permit farming. This linear arrangement of environmental zones also exists in other parts of the highlands, where the variations are not only due to elevations but also to other environmental factors as well--climatic, soils, and geological structure, to name but a few of the more obvious ones. (See Figure 1)

## Coping With Environmental Diversity

In order to meet their minimal needs, groups living in the upper part of the Mantaro Valley, for example, used roughly the same subsistence techniques that were available to groups living in different environmental settings in the same or another valley. A group that needed something that was not available or could not be produced locally had to deal with the linear arrangement of food resource areas. Its members could acquire the particular resource only by gaining access to land in an environmental setting where it was available. A group wanting something that was in short supply locally had to deal with the repetitive arrangement of resource areas. Its members could only acquire additional supplies of this commodity by gaining access to lands in similar environmental settings in adjacent areas.

Market places and market exchange are, of course, one way this can happen; goods are brought from the various zones where they occur to a central place, and the people determine the prices of the various items in terms of the principles of supply and demand. An individual will sell his own goods and buy those that he cannot produce. However, ethnohistoric sources indicate that markets and the market exchange principle were not very important in the Andean area prior to the arrival of the Europeans in the sixteenth century. Even today, Andean markets are not as important economically as we have been led to believe by anthropologists who have emphasized their similarities to those found elsewhere in the world, rather than their differences. Nobody who has ever spent even a little time shopping in Latin American markets for the essentials of life would confuse what happens in an Andean market with what happens in those of Mexico. The functions of markets and the behavior associated with them are very different in the Andean area.

The Andean peoples worked out a distinctive way of coping with the environmental diversity of their area. This has been called the "ideal of community self-sufficiency," "vertical control" of ecological zones, and the "archipelago model"(Murra 1972). The first term

emphasizes what the people were actually trying to do: to have access to all of the resources they needed to sustain themselves throughout the year. These groups range in size at the present time from the individual nuclear family to the comunidad indigena and can include virtually any social unit with intermediate numbers. In the past, these groups ranged in size from a few thousand individuals to kingdoms with populations of more than 100,000 according to ethnohistoric information. The other two terms--vertical control and the archipelago model--emphasize the spatial arrangement of resources in the Andean area and of the people exploiting them. All of the resources utilized by a group do not occur naturally or cannot be produced in a single environmental zone; consequently, the members of a group must exploit several different resource areas which are usually not contiguous with each other. This means that various parts of a group lived and worked in different localities and were often separated from each other by several days' journey. As a result, their landholding patterns resembled a chain of islands of varying sizes, each located in a different environmental zone where certain resources were available and separated from one another by lands belonging to other groups.

The segments of a population, scattered over the landscape and frequently separated from each other by considerable distances, were interdependent and were bound together by kin ties and membership in the same social unit or ethnic group. The modes of economic integration for most commodities involved reciprocity and redistribution, rather than the market exchange principle. The individuals in one locality gave their goods and services to individuals in other localities where these commodities were absent or in short supply and, in return, received what they could not provide for themselves.

These reciprocal transactions probably occurred in various ways: sporadic traffic or regular traffic between kin-related aggregates or between different segments of the population; redistribution centers where goods were collected, stored, and reapportioned among the various localized segments of the group; kinship exchanges; and probably ceremonies held at various times of the year which brought two or more segments together in the same place. All of these mechanisms can be documented in the ethnohistoric and ethnographic literature.

In addition there was long distance traffic in certain commodities that were processed by specialists in certain centers. For example, spondylus shells which grow in warm waters off coastal Ecuador that were a favorite food in Peru occur at many prehistoric Peruvian sites (Murra 1972). Another example might be the making of turquoise ornaments of imported raw materials in the Las Turquesas compound at Huari that seem to have been redistributed through and from that important center. Exactly how this traffic occurred is not clear at the present time; however, it need not be based on the market exchange principle, since there are many examples of pre-capitalist societies where such traffic was administered by leaders of ethnic groups or through some redistributive mechanism. Further, it seems possible some of the mechanism may have pushed the balance of payments in favor of dominant segments of Andean groups.

## The Chronological and Spatial Frameworks

In order to present and discuss the evidence for interaction patterns in central Peru, we have established chronological and spatial frameworks that differ somewhat from those commonly used in the central Andean area. We have divided the time from about 20,000 B.C. to A.D. 1534 into fourteen periods that correspond in the following ways with the most commonly used chronological frameworks:

TABLE I

| | | |
|---|---|---|
| Period 1 | 20,000 to 13,000 B.C. | Preceramic Period I (early) |
| Period 2 | 13,000 to 10,000 B.C. | Preceramic Period I (late) |
| Period 3 | 10,000 to 7000 B.C. | Preceramic Periods II and III (early) |
| Period 4 | 7000 to 5500 B.C. | Preceramic Period III (late) |
| Period 5 | 5500 to 4200 B.C. | Preceramic Period IV |
| Period 6 | 4200 to 2500 B.C. | Preceramic Period V |
| Period 7 | 2500 to 1750 B.C. | Preceramic Period VI |
| Period 8 | 1750 to 1050 B.C. | Initial Period |
| Period 9 | 1050 to 450 B.C. | Early Horizon Epochs 1 to 6 |
| Period 10 | 450 B.C. to A.D. 300 | Early Horizon Epoch 7 to Early Intermediate Period Epoch 3B |
| Period 11 | A.D. 300 to A.D. 650 | Early Intermediate Period Epoch 3C to Middle Horizon Epoch 1B |
| Period 12 | A.D. 650 to A.D. 850 | Middle Horizon Epoch 2A to 2B |
| Period 13 | A.D. 850 to A.D. 1425 | Middle Horizon Epoch 3 to Late Intermediate Period Epoch 7 |
| Period 14 | A.D. 1425 to A.D. 1534 | Late Intermediate Period Epoch 8 to Late Horizon |

There is no fundamental conflict between our chronological framework and the more widely used ones in the Andean area; we merely found different moments in time more convenient for dividing one period from the next. The absolute dates assigned to these periods, particularly the first twelve of them, are only approximations at the present time, and will undoubtedly have to be revised somewhat as the correlation between radiocarbon measurements and the Christian calendar is worked out in more detail.

We have divided central Peru into only four regions on the basis of where archaeological field investgiations have been carried out which give at least some data in all of our periods. These are the Ancon-Chilca Region on the central coast, the Huarochiri Region on the upper western slopes of the Andes in central Peru, the Huancayo-Junin Region in the upper part of the Mantaro Valley in central Peru, and the Ayacucho-Huanta Region in the middle Mantaro Valley and on the upper eastern slopes of the Andes. Obviously, considering only four regions does not give a complete picture of the area nor does it show all the interaction that may have been going on. Ideally, we would have liked to include in this study data from the selva, montana and other parts of the western Andean flanks, such as the Callejon de Huaylas, but we have not done so because complete sequence, particularly on the crucial preceramic levels, does not exist (Lynch and Kennedy 1970). We believe, however, that even the data we shall present does give the outlines of the sort of processes that were taking place over long-time periods in this interaction sphere. Future studies, particularly in the other sort of environmental or life zones of central Peru, we hope will not only test our hypotheses about culture process, but also supplement them, modify them, and even correct them.

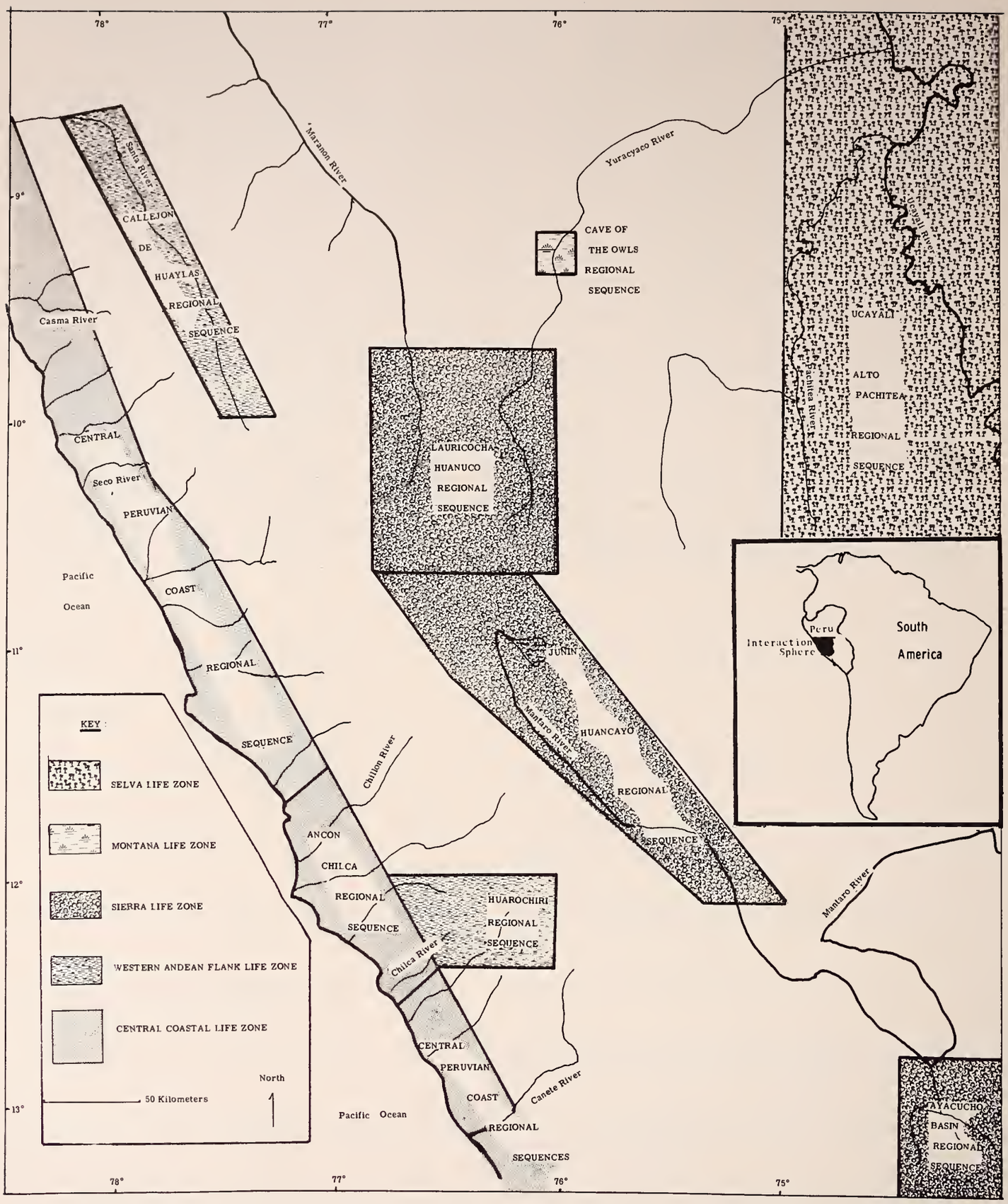



Figure 2. The principal investigated regions of the central Peruvian Prehistoric Interaction Sphere.

| COASTAL | COASTAL MOUNTAIN FLANKS | | SIERRAS | | | MONTAÑA | SELVA | | |
|---|---|---|---|---|---|---|---|---|---|
| Central Coast | Huarochiri | Callejon de Huaylas | Ayacucho Huanta | Huancayo Junin | Huanuco | Cave of the Owls | Pachitea | Pucallpa | |
| Colinas | Quiche | Initial Period Pottery | Wichgana | San Blas | Kitosh | Fine Ware | Pangotsi | Late Tutishcamyo | 3000 B.P. |
| Brown Ware | | | | | | | | | |
| Gaviota | | | | | | | | Early Tutishcamyo | |
| Conchas | | | Andamarka | | Waira-jirca | | Cobichaniqui | | 4000 B.P. |
| Playa Hermosa | | Punta Callan | Cachi | Tinayuta | Mitas | | | | |
| Pampa | | | | | | | | | 5000 B.P. |
| Encanto | | | Chihua | Callavolluari | | | | | |
| Corbina | | Quishqui | | | | | | | 6000 B.P. |
| | Tres Ventana III | Punca | | | Ambo Lauricocha III | | | | |
| Canario | | Guitarrero IIb-c | Piki | Pacha machay | | | | | 7000 B.P. |
| Luz | | | | | | | | | |
| Arenal | Tres Ventana II | Lamprus | | | | | | | 8000 B.P. |
| | | | Jaywa | Junin | Lauricocha II | | | | 9000 B.P. |
| Pampilla | | | | | | | | | |
| | Tres Ventana I | Guitarrero Ib-IIa | Puente | Panalagua | Lauricocha I | | | | 10,000 B.P. |
| Chirateros | | | | | | | | | 11,000 B.P. |
| Oquendo? | | Yungas Ia | little h? | Hurpac | | | | | 13,000 B.P. |
| Red Zone? | | | Ayacucho | | | | | | 16,000 B.P. |
| | | | Pacaicasas | | | | | | |

Table II. Sequences of pre-ceramic and early ceramic phases in some of the regions of the various life zones of the Central Peruvian Interaction Sphere.

# CHAPTER II

## THE SEQUENCE OF PERIODS

### Period 1: 20,000 - 13,000 B.C.

Our evidence for this period in the Central Peruvian Interaction sphere is woefully inadequate. However, we do have some excavated remains which are somewhat better documented than others of this time period not only in South America but also in North America. Because of the uniqueness of these remains, we are describing them rather fully even though our evidence of Interaction at this period is nil.

#### The Ayacucho-Huanta Region

The Pacaicasa Phase, from Zones k through il of Pikimachay Cave, has four radiocarbon determinations that pertain to it. Bones of Zone j bear a determination at 17,650 ± 3000 B.C. made by the UCLA Laboratory (UCLA 1653A) that is confirmed by a date of 18,250 ± 1050 B.C. (I5851A) made by Isotopes, Inc. on part of the same worked bone while the overlying Zine i bears a bone collagen date of 14,100 ± 1200 B.C. (UCLA 1653B) and Zone il is dated at 12,750 ± 1400 B.C. (UCLA 1653C). While there may be some doubts about the accuracy of the UCLA dates that are neatly in stratigraphic order, the conformity date of Zone j by Isotopes (I5851-A) has only a - sigma figure of 919 ± 10 that can hardly be questioned. The phase is represented by 71 artifacts studied by our flint-knapping experts C. Phagan, R. Knudson and A. Nelken-Terner. Also, there were about 100 flakes and cores, some of which are foreign to the cave, in association with 96 bones of extinct animals, some (about 8) of which have been worked in the four lowest cement-like strata, Zones k, j, il, and i of Pikimachay Cave. The artifacts include four kinds, the most numerous (21) being a sort of chopping tool. All but one are made of volcanic tufa, probably from the cave wall itself, and the majority of them (13) are made from slabs. Two of these have straight, almost concave edges while eleven have convex edges. Four others are bifacial (chipped to a rough ellipsoidal form), and four have evidence of their being used as a hammer and one of them is of basalt foreign to the cave. Also made from large chunks of volcanic tufa are a series (19) of unifacial tools with deep concave edges. Of these,two have two deep concave edges showing evidence of retouching and use. These we have called spokeshaves, but they could very well have been used to scrape meat or bone rather than wood. The other major group (17 tools) are thinner unifaces with retouching and/or use along a straight to convex edge; of these 17, two of the thinner ones are pointed and could have served as projectile points, while one from the top Zone i has a burin blow on it. Of the other 14 large artifacts, two are of material foreign to the cave; one of these is roughly plano convex, and both have chipping along one of their narrow edges. Five have been chipped in such a way that there are a series (2 to 6) spurs or denticulates on them. Microscopic study of wear-patterns suggest they were used as choppers and scrapers.

Although there have been expressed some doubts that these objects are tools, this has only been done by those who have not studied all the artifacts in question (Lynch 1974).

The associated bones are mainly of unidentified species of giant ground-sloths and include a jaw, a tooth, 13 vertebrae, 4 scapular fragments (two of which have been cut), a radius, 3 ulnae, 2 metapodials, 1 carpal bone, 1 phalanx, 2 ribs, and 4 fragments of long bones, all of which had been shattered by chopping or hammering. However, one tooth from Zone il has been identified as Scelidotherium tarijensis, and a fragment of a jaw, sternum, humerus, and two medapodials, all but one from Zone i, belong to Scelidotherium sp. as do nine bones (2 jaw fragments, 3 cannon bones, 2 femora, a carpal bone and a metapodial) are of horse, identified as Equus andium.

Also from the same zone are 3 femora and a jaw bone of the rodent Phyllotis sp., and from Zone i is a vertebra and femur of a large carnivore. There also was a single femur of a deer from Zone j.

Although the sample of bones identified by Dr. Brian Patterson is small, there is a suggestion of climatic change during Pacaicasa times. Analysis of the soils of these deposits by N. Rutter is not complete, but even chemical analyses from the various zones tends to confirm the climatic change by hypothesis, for Zones k and j are less acidic (pH of 6.7 to 7.7) than are i and il (pH of 7.85 to 8.15) and also have traces of organic matter, while Zone i has traces of organic matter, while Zone i has traces (.83 and .42) of carbonates.

The deer bone plus the evidence of lower acidity and organic matter in the soils suggest Zone j was perhaps at a wet climatic period when there was vegetation of a more woodland-type near the cave, while the bones of horse, rodents, and cat, plus the soils, suggest Zones i and il were at a drier period when the vegetation was of a more grassland-type. What this means in terms of more general geologic periods is difficult to determine on the basis of our present analysis, and the two opinions now given are dramatically opposed to each other. N. Rutter and T. Patterson suggest the earlier wet-period, roughly from 22,000 to 17,000 to 15,000 B.P., are of an interstadial, while MacNeish takes the opposite view. Either interpretation has an obviously wider implication concerning glaciation not only in the Andes but also in the world, and much more study of this problem is needed (Martin 1972) and the existence of the complex cannot be ignored because of incomplete ecological data (Lynch 1974).

## Period 2: 13,000 - 10,000 B.C.

Again materials of this time are relatively sparse for not only Peru but much of South and North America. It is rather surprising that the Central Peruvian area has some materials from three of its four regions where there is some evidence of interactions. Since the ecofacts and artifacts from the Ayacucho complex are perhaps the most

fully documented for any region in the New World, we again will be giving proportionately more descriptions of them than we shall for other manifestations written about in this volume.

## The Ancon-Chilca Region

The Red Zone Complex was isolated in the lowest layer of a stratified quarry-workshop at Cerro Chivateros in the Chillon Valley. The artifacts, including a river cobble hammerstone, probably date between 11,500 and 10,500 B.C., judging by the geological context in which they occur. The Oquendo Complex was isolated at a site about four kilometers south of Cerro Chivateros and possibly has an age of 10,500 to 9,500 B.C. The Tortuga Complex, found in the lower Lurin Valley, shares tool types with the Red Zone and Oquendo Complexes and as a result has an estimated age of possibly 11,000 to 10,000 B.C.

The only evidence for subsistence activities comes from the Tortuga site. It is located in the lomas, and large quantities of beach-dwelling marine molluscs occur there. Presumably, the Tortuga population ate marine shellfish and lomas plants during the coastal wet season (June-October). They may also have consumed game that lived in the lomas during the wet season and on the valley floor during the dry season (November-May).

## The Huancayo-Junin Region

A small assemblage of obsidian tools and flakes was found at Hurpac, which is located on the edge of a small glacial lake near Jauja in the Mantaro Valley. Judging by the similarities between these tools and those of better dated complexes in the central Andes, the assemblage has an estimated age of 11,000 to 10,000 B.C.

## The Ayacucho-Huanta Region

Our second phase, Ayacucho, from roughly 15,500 B.P. to 13,000 B.P., as well as the seven artifacts from an unnamed complex, roughly in the period from 13,000 to 11,000 B.P. also, have more bearing on the problem of early man in America than they do on the early domestication of plants and animals. However, unlike most areas of the New World, there is sufficient material even at this early period from a number of regions in central Peru to furnish hints of interactions between various spheres of the area--a process that is of key importance in the understanding of the origin and spread of domesticates in later periods.

The Ayacucho complex also comes from Pikimachay Cave, specifically from Zones h1 and h. A bone from Zone h bears the date of 12,200 $\pm$ 180 years B.C. (UCLA 1964). These two zones have produced 209 artifacts, over a thousand chips and cores (about one hundred of which have been worked) in association with 517 animal bones, and a relatively large sample of pollen. Tools are a continuation of most

of the older type albeit in very different proportions except slab-choppers, but now almost as many of them were made of chalcedony, pebbles, basalt, etc., all foreign to the cave, as from local material. New types of tools occur and include split-pebble scraper-planes (5) and spokeshaves (6), pebble-choppers (3), a series of flake side-scrapers or knives (22), unifacial projectile points (9), projectile points made from horse metapodials (2), a point from a sloth's rib, seven burins and a fluted wedge, two fleshing tools made from sloth ribs, an ulna-awl, an antler-punch, and an ornament, cut from a camel's phalanx. Distributions of bones and artifacts in Zone h show five concentrations suggesting five forays into the cave when a number of activities were undertaken, although the initial purpose may have been to beard the beast (sloth) in his den.

Bones include many (168) sloth bones from almost every part of the body, while two jaws and a humerus are of a large species of Scelidotherium, a tooth is of a small species of this genus, and a humerus, carpal, femur, and nine radii are of Megatherium tarijense.

Deer bones (25) occur, and there are six limb fragments and a tooth of Equus andium, 27 bones of the rodent Phyllotis, three limb-bones of a large cat, 13 limb-bones of a puma (Felix concolor), a skull and radius of Dusicyon sp., a jaw and vertebrae of Conepatus, limbs of Lagidium peruanum, and six bones of llama, all the latter in doubtful contexts. It might be added that there is also a child's jaw with teeth, a radius, some phalanges and ribs--the oldest remains of man himself in South America.

The kinds of animals uncovered suggest a wet climate and more woodland environs around the cave. This is confirmed by the pollen that includes Alnus (47 grains), Salix (3), Compositae (15), Dodonaea (28), sedge (11), Gramineae (73), 8 Chenopediaceae, 2 Ephedra, 2 Caryophyllaceae, and 2 Amaryllidaceae.

This complex of pollen and other materials contrasts with that in the overlying Zone h which contained a scraper-plane, four flake side-scrapers, a prismatic blade, and a fragment of a lenticular point with a diamond-shaped cross-section associated with a horse medapodial, three llama bones, and two bones of Phyllotis. The pollen contains mainly grass (127), some Compositae (25), sedge (17), and Alnus (19), as well as Dodonaea viscosa (2), Artemisia (1), Rosaceae (3), Cruciferae (3), Ranunculaceae (3), Polemoniaceae (2), Alternanthera (5), Gentianaceae (1), and Bromeliaceae (2).

Again, there are different interpretations with our geologist suggesting Zone h is of a glacial advance and Zone h as the first postglacial phase, while MacNeish is of the opinion that Zone h of 14,000 B.P. is of an interstadial and Zone h of 13,000 to 11,000 B.P. represents the final glacial advance. Again more study is necessary.

## Interactions

On a regional basis, obsidian which does not outcrop on the central coast, occurs at the Oquendo quarry site in the lower Chillon Valley. Its presence suggests that some raw materials were exchanged between coastal and highland populations. The occurrence of burins in the Oquendo, Hurpac and Ayacucho complexes suggests that flint-knapping techniques were also shared by coastal and highland populations in central Peru.

On a more general level these central Peruvian complexes with their emphasis on unifacial tools including burins as well as the bone tools in Ayacucho have similarities to other early complexes in Latin America. In the immediate area these would be the poorly analyzed Guitarrero Ia materials from the Callejon de Huaylas which bear at least one date of 12,560 ± 360 B.P. (Gx 1859) (Lynch and Kennedy 1970), while the materials from El Abra Cave in Colombia dated at 12,400 ± 160 (Gx 5556) (Hurt and Van der Hammen 1972), the materials from 11 and 12 of Los Toldos Cave, Patagonia dated at 12,600 ± 600 (BUA-1) (Cardich, Cardich and Hajdak 1973), the Valsequillo materials from Puebla, Mexico dated at 21,850 ± 850 (W1895) (Irwin-Williams 1973), and Tlapacoya from the Valley of Mexico dated at 23,150 ± 950 (Gx 959) and 24,000 ± 400 (A794B) (Mirambell 1973), and, perhaps, the lower levels of the Alice Boer site in Brazil might also be related.

## Period 3: 10,000 - 7,000 B.C.

The kinds of relationships that existed between coastal and highland populations in central Peru, as well as their intensity, appear to have changed significantly from the preceding period. There is evidence that raw materials continued to be exchanged and flint-knapping techniques were still shared by highland tool assemblages during this period; however, they are less striking than before. The tool assemblages of coastal populations have closer ties to ones found in arid and semi-arid environments elsewhere in western South America than to those found in the highlands of central Peru.

## The Ancon-Chilca Region

The Chivateros I (ca. 9500-8500 B.C.), Chivateros II (8500-7000 B.C.), and Pampilla (7500-ca. 7000 B.C.) Complexes have been isolated at the stratified quarry-workshop on Cerro Chivateros and at other localities in the lower Chillon Valley. The Conchitas Complex from the lower Lurin Valley has its closest relationships with the Chivateros II materials from the north.

The best evidence for subsistence--admittedly inadequate--comes from the Conchitas site and indicates that the population consumed marine shellfish and lomas resources during the coastal wet season. Judging by the large numbers of projectile points in all of the complexes, the central coast populations hunted game that lived in the lomas during wet season and on the valley floors during the dry

season. If their predecessors in the area made projectile points out of perishable materials rather than stone, which seems likely given the nature of the tool assemblages, then hunting may have been no more important than it was earlier.

## The Huarochiri Region

Radiocarbon measurements from the lower levels of Tres Ventanas Cave indicate that it was occupied during this period (Engel 1970). The abundance of projectile point and end scraper types, some of which are similar to those of the Puente Complex in the Ayacucho-Huanta Region, suggest that hunting was one of the main activities of the earliest known inhabitants of this area. No data are available on the size of the occupation or on the seasonality of their activities.

## The Huancayo-Junin Region

R. Matos has excavated a high elevation cave called Panalagua, which is located southwest of Lake Junin. There are vast quantities of large mammal bones in the lower levels of the cave which indicate a series of specialized hunting camps. The artifacts are very similar to those of the Puente Complex; however, there are more Lauricocha I type points and leaf-shaped points like those of Chivateros II than occur in the Puente and early Tres Ventanas Complexes. Similar sites, occurring at lower elevations, have been found north of Lake Junin and suggest that some sort of seasonally scheduled hunting activities may have played an important role in the subsistence economy of this region.

## The Ayacucho-Huanta Region

Components containing Puente Complex (9000-7100 B.C.) artifacts have been excavated and found on the surface in three of the present day environment zones of the area. However, soil profiles and pollen suggest that one of the present environmental zones--the thorn forest--was much diminished by the wet conditions and that much of its area was covered by forests. Mammal bones found in these assemblages indicate that the Riverine thorn forests were occupied during the wet season (October-March) and that the much expanded humid woodland environment zone was occupied during the dry season (April-September). The main activity of the dry season camp was hunting deer and camelids, although there was also some trapping and plant collecting being done. This contrasts with the activities being carried out at the excavated wet season camps which contain proportionately fewer deer and camelids and more cavia and other small mammals probably obtained by trapping. Although the evidence is not conclusive, it strongly suggests that there was some kind of seasonally scheduled subsistence system in the area. All of the six excavated components are uniformly small in size and suggest that the base group was a microband composed of not more than a couple of families.

Interactions

Several conceptually distinct processes seem to be taking place during this period. For descriptive purposes, it is convenient to divide them into two groups, one of which is concerned with what is happening on a continent-wide scale and the other of which is concerned with what is happening in central Peru--partly as a result of the first group of changes.

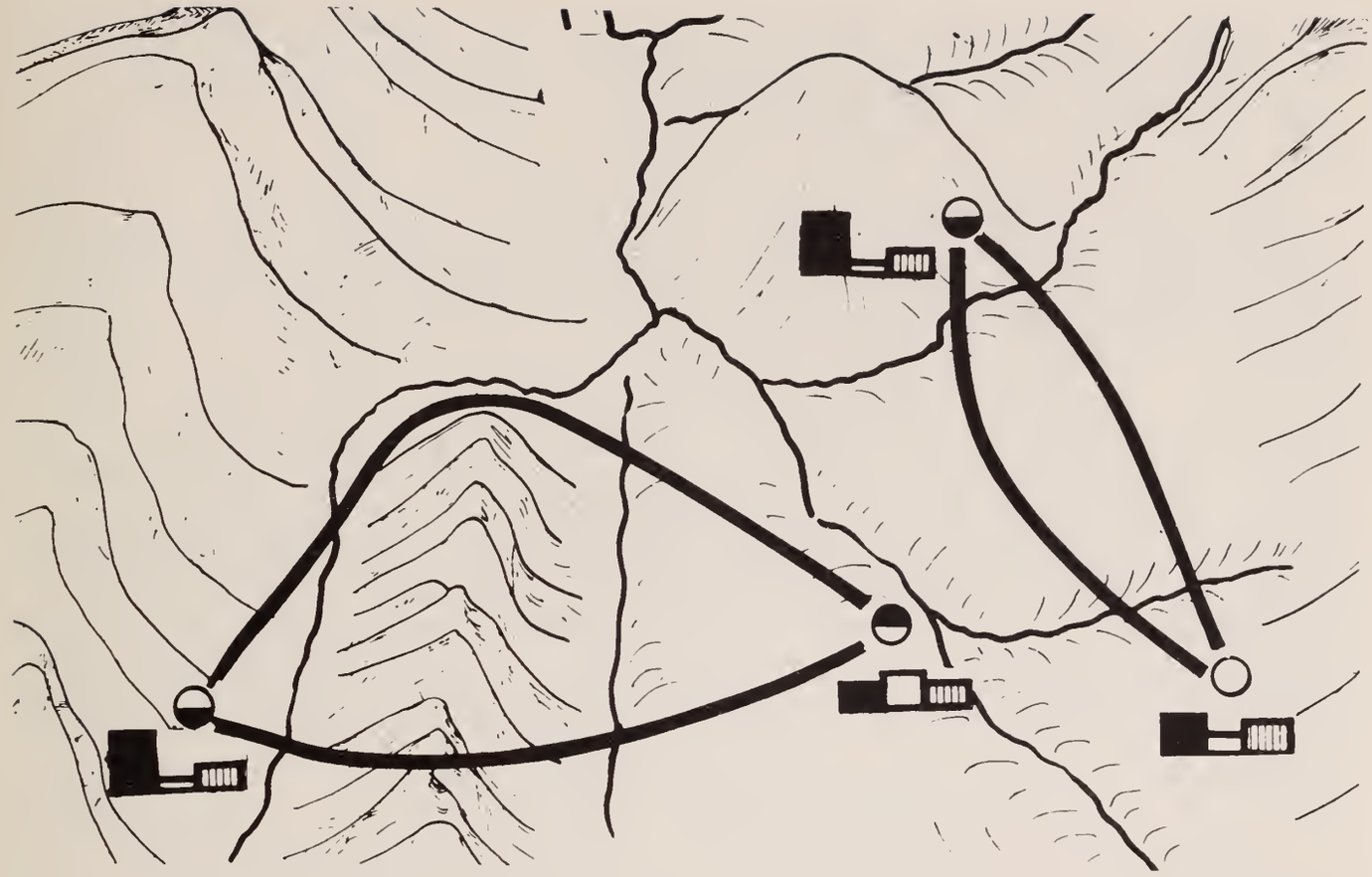
On a continental scale, two processes seem to be taking place in late glacial and early postglacial times. The first which is very poorly understood is a change in the distribution and configuration of major environmental zones after the glacial maximum pattern toward something resembling their modern distribution and configuration. The second is the distribution of certain point types in South America which seem possibly correlated with the distributions of their ill-defined environmental zones during this period.

Fluted or basically thinned projectile points occur mainly in relatively moist grassland environments and include ones from highland and coastal Ecuador, the El Inga I Complex (Bell 1965) and the isolated fluted point fragment from Carolina on the Santa Elena Peninsula; Panama, the unassociated points from Madden Lake (Sanders 1959); the southern tip of South America, the Magellan I (Bird 1969) and Los Toldos, level 9-10 (Cardich, Cardich and Hajdak 1973) Complexes, and eastern South America, various isolated Magellan I type points found in eastern Argentina, Uruguay, and Brazil.

The second group of tools are characterized by nonstemmed percussion-flaked bifaces that have been referred to as the Andean Biface Horizon (Lanning 1967). Assemblages assigned to this tradition occur mainly in arid or semi-arid environments and include all of the coastal complexes mentioned above as well as ones from Venezuela (the late Joboid Series), coastal Ecuador (the Manantial Complex), northern Chile (possibly the Talabre, Loma Negra, and Aguas Verdes Complexes), northern Argentina (possibly the Altoparana I Complex from Lomada in northeastern Argentina), and along the Parana River in Paraguay (Willey 1971).

The third complex would be characterized by straight and incipient stemmed points with weak shoulders and this complex seems to have occurred in the forested area of Venezuela, Brazil and highland Colombia. The Toquendama complex of Colombia (Correal 1974) Casitas of Venezuela (Rouse and Cruxent 1963) the Lagoa Santa (Hurt and Blasi 1969) and middle levels of the Alice Boer site of Brazil (Conceicao 1973) might be examples of such an adaptive complex.

The fourth group characterized by relatively large incipient stemmed points with sharp shoulders seems to correlate with wetter environments of high elevations. Perhaps it should be divided into two groups based upon environmental adaptations. Lauricocha I as found in cave L2, layer R-Q (Cardich 1964), Guitarrero IIa-Ib (Lynch



SETTLEMENT PATTERN

Spring-Summer (October-March) Microband Camp

Fall-Winter (April-September) Microband Camp

SUBSISTENCE ACTIVITIES

Hunting

Trapping

Plant Collecting

Figure 3. An isometric view from the south of the southern part of the Ayacucho Basin showing the reconstructed settlement and subsistence patterns during Period 3: 10,000-7000 B.C.

and Kennedy 1970), Peru, Puente of Ayacucho (MacNeish, Nelken-Terner and Garcia Cook 1970), the lowest level of Tres Ventana Cave (Engel 1972) and others would be examples of this somewhat better defined group.

On the other level, four processes seem to be occurring in central Peru. First, the presence of obsidian in all of the highland regions, even those where it does not outcrop, as well as Chilca and Paracas sites on the coast indicates the continuing exchange of raw materials. Second, in the lowest levels of Tres Ventanas Cave there are shells and plants definitely imported from the coast (Engel 1970) but this is hardly the transhumance process Lynch writes of (Lynch 1967). Apparently, food resources were moved from at least one region to another seemingly for the first time in central Peru. Third, the similarities between some of the Early Panalagua and Puente projectile points and lithic techniques and those of the Chivateros II Complex on the coast indicate a continuing relationship between the coastal and highland regions. Fourth, all of the groups are apparently beginning to practice some form of seasonally scheduled subsistence system.

## Period 4: 7000 - 5500 B.C.

This period is characterized by a number of features. First, the pattern of tool kits that were closely correlated with the distribution of major environmental zones in the preceding period broke down rapidly, presumably as populations of different parts of these biomes gained greater understanding of their local regions and developed different economic orientations. Second, there were closer ties between the coastal and highland populations of central Peru. Raw materials and some food resources continued to be exchanged between the highlands and coast, and there was an increased exchange of technological ideas.

### The Ancon-Chilca Region

There are no known archaeological assemblages from the central coast that date to the first millenium of this period. The *lomas* began to expand significantly along their lower edges after 6000 B.C. because of increased precipitation; consequently, *lomas* food resources were more plentiful than they had been earlier. The *lomas* between Ancon and the lower Chillon Valley was occupied during the wet season that manufactured the Arenal Complex (*ca.* 6000-5300 B.C.). This group utilized the abundant plant resources of the lomas, hunted game that grazed in the area, and supplemented these foods with rock-dwelling marine shellfish that were brought from the ocean which is an hour and a half's walk at the closest. Gourd used for containers was also present in refuse at the site. During the dry season, the population presumably returned to the floor of the Chillon Valley and exploited the seasonal resources that were available in these habitats.

## The Huarochiri Region

The middle levels of Tres Ventanas Cave date to this period (Engel 1970). Many of the artifacts are similar to those of the Junin Complex, and the large numbers of projectile points and scrapers may again be taken as evidence for the importance of hunting in the subsistence economy of the region. Coastal materials--such as marine shellfish and possibly stone--suggest either some sort of exchange network or transhumance pattern involving the coast during this period.

## The Huancayo-Junin Region

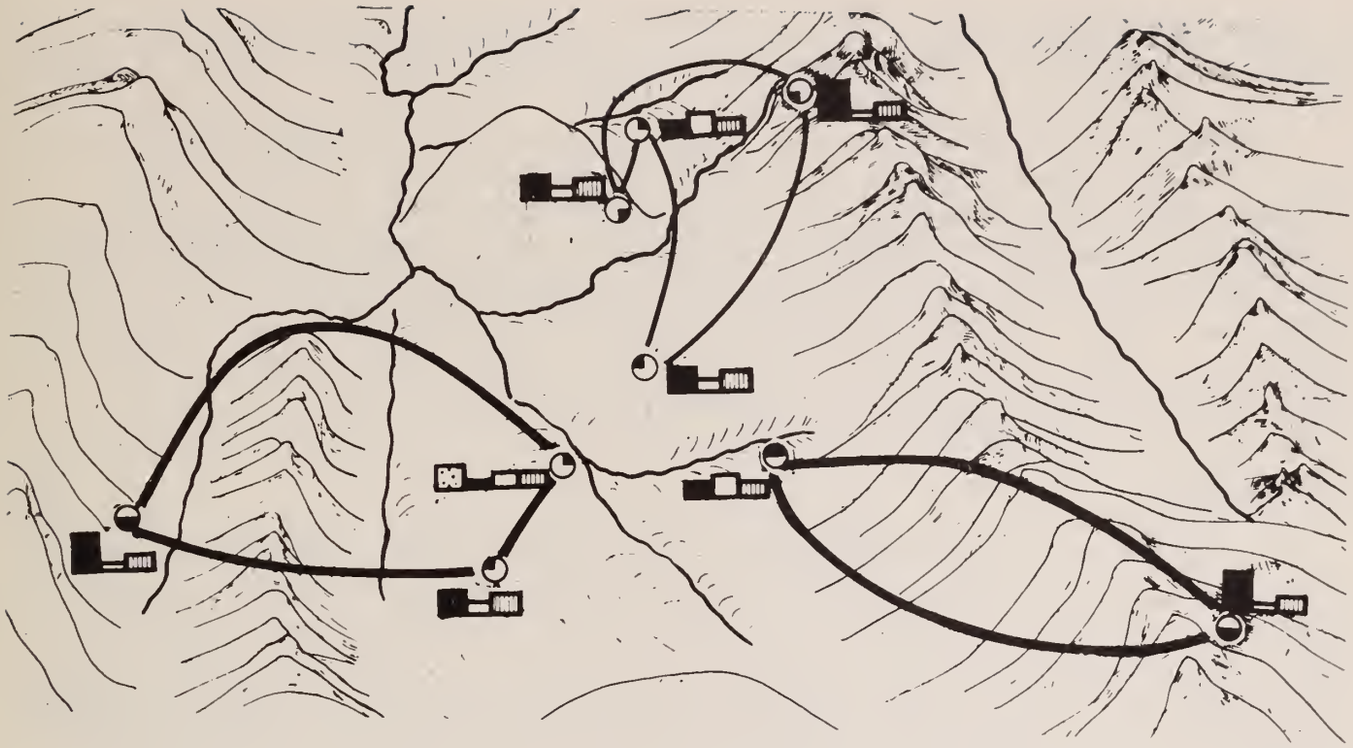
The middle levels of Panalagua Cave in the high puna, the lower levels of Pachamachay Cave near Lake Junin in the lower puna, and the lower levels of Cuchimachay Cave on a stream at the base of the puna have all yielded a single artifact complex--the Junin Complex--that is not radically different from the Jaywa Complex of the Ayacucho-Huanta Region in terms of its projectile point and scraper types. Camelid bones are abundant in all three localities. It is possible that the population of this region hunted on the basis of some sort of seasonal round; however, the exact nature of these activities still remains to be worked out.

## The Ayacucho-Huanta Region

The Jaywa Complex (7100-5800 B.C.) is represented by many ecofacts and artifacts from 12 excavated components and one surface site. Jaywa sites occur in five of the six environmental zones of the region. A site excavated in the Humid Woodlands zone contained five living floors that represent dry-season microband camps, judging by the large quantities of dry-season mammal bone and projectile points. Furthermore, there were achiote seeds on one of the floors, and two of the three human feces recovered contained the stem of a berry, a grass seed, and monocot and dicot plant fibers in addition to meat debris. Thus, the dry-season hunters of the Humid Woodland were also collecting some plant foods. Two sites in the low puna seem to have had similar subsistence patterns. One excavated site then in a wetter thorn scrub contained bones and seeds and probably represents a microband occupation of hunters and plant collectors during the latter part of the dry-season (August-September). A slightly later floor at the same site, about 5600 B.C., contained Piki Complex artifacts and yielded the rind of a gourd. One site in the Riverine thorn forest zone was composed of a series of living floors representing microband occupations during the wet-season (October-March). Each floor was covered with literally hundreds of cavia some of which may have been tamed, small mammal bones, a few deer and camelid bones. The kinds of bones recovered suggest that trapping was more important than hunting. The occurrence of some charred seeds and a grinding stone suggest that plant collecting was also more important than hunting during this season. Microband and at least two macroband camps were found in the area of the present dry thorn scrub which

| Environmental Zones | Xerophytic Zone | Thorn Forest | | | | | | | | | | | | | Humid Woodlands | | | | Low Puna | | | High Puna | Dates |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Riverine Sub-zone | | | Scrub Sub-zone | | | | | | | | | | | | | | | | | | |
| Phases | Surface Components | Excavated Sites | | Surface Components | Excavated Sites | | | | | | | Surface Components | | | Excavated Sites | | | Surface Components | Excavated Sites | | Surface Components | Surface Components | |
| | | Ac 158 | Ac 18 | | Ac 100 south room | Ac 100 central room | Ac 100 north room | Ac 102 | Ac 244 | Ac 117 | Ac 240 | | | | Ac 335 | Ac 300 | Ar 23 | | Ac 300 | Ac 351 | | | |
| Wichgana Andamarka | Ar 32<br>Ar 406<br>Ar 421 | | Zone G-H-J-K | Ar 141 Ar 143 As 316 As 330<br>Ar 142 Ar 245 As 330<br>Ar 241 Ar 144 As 121 As 62<br>Ar 131 Ar 331 As 334 As 336 | | | | | | | Zone G | Ar 337 As 223 As 308b<br>Ar 234 As 320 As 303<br>Ar 444 As 319 As 306<br>As 221 As 235 | | | | | Zone D1-D2<br>Zone D2-D3<br>Zone D4-D5<br>Zone D6 | As 300b<br>As 378b<br>As 384b | | Zone C | Ac 300D<br>Ac 300C<br>Ac 391c<br>As 497b | As 501b<br>As 504 | 1000 B.C. |
| Cachi | As 400<br>As 395 As 401<br>As 393 As 411<br>As 390 As 417b<br>Ar 108 As 420<br>Ar 109 As 422<br>As 40 As 423 | Zone Ib Zone Ia<br>Zone Ic<br>Zone Id<br>Zone Ie<br>Zone If | | Ar 338<br>As 147<br>As 194<br>As 195<br>As 313 | | Zone F<br>Zone G<br>Zone H | Zone VI | | Zone E | | Zone H | As 386 As 348<br>As 370 As 350<br>As 371b Ar 168<br>As 375 As 161<br>Ac 120 As 239 As 166<br>As 268 As 170<br>Ar 273 Ar 308a | | | | | Zone D1 | As 267<br>As 284<br>As 360<br>As 380 | | Zone C1<br>Zone C2 | Ac 300b<br>As 497a | As 498 | 2000 B.C.<br>3000 B.C. |
| Chihua | Ar 404 Ar 427<br>As 401 As 422b<br>As 418 As 420<br>As 417 | Zone If s<br>Zone Ig<br>Zone Ih1-2<br>Zone Ih<br>Zone Ij<br>Zone IIa0 Zone II | | As 364<br>As 374<br>As 147<br>As 292 | | Zone X | Zone VII<br>Zone VIII | Zone VI | | Zone D | | As 396 As 324<br>As 3906 As 280<br>As 372 As 269<br>As 371a | | | | Zone E | | As 179<br>As 165<br>As 378<br>As 309<br>As 384 | Zone C south | | As 351b<br>As 496 | As 501a | 4000 B.C. |
| Piki | As 411<br>As 420<br>As 417<br>As 422<br>As 328 | Zone III, Zone IIb, Zone IIa, IIa1<br>Zone VI, Zone V, Zone IV<br>Zone VIIa, Zone VII, Zone VIa<br>Zone VIII<br>Zone IX Zone IXa<br>Zone X | | As 22<br>As 198 | Zone f<br>Zone f1 | Zone K<br>Zone U<br>Zone V<br>Zone W | | Zone VII | Zone F | | | As 390a As 172<br>As 101 As 176<br>As 296 As 208<br>As 169 As 174 | | | | Zone F | | Ac 371 | | Zone D | Ac 300a | As 502 | 5000 B.C. |
| Jaywa | As 158a | Zone XI<br>Zone XIa<br>Zone XII<br>Zone XIIa<br>Zone XIII | | As 2 | Zone f2 | | | | Zone G | | | As 369<br>As 270<br>As 242<br>Ac 204a | Zone C<br>Zone D<br>Zone E<br>Zone F<br>Zone G<br>Zone H | | | | | As 204 | Zone C north | | Ac 351a | As 499 | 6000 B.C.<br>7000 B.C. |
| Puente | | Zone XIV | | | | | | Zone VIII | | | | As 306 | Zone I<br>Zone J<br>Zone J1<br>Zone J2<br>Zone K<br>Zone J3 | | | | | | | | | | 8,000 B.C. |
| Biface | | | | | Zone h | | | | | | | | | | | | | | | | | | 10,000 B.C. |
| Ayacucho | | | | | Zone h<br>Zone h1 | | | | | | | | | | | | | | | | | | 12,000 B.C. |
| -Pacaicasas | | | | | Zone i<br>Zone i1 | | | | | | | | | | | | | | | | | | 16,000 B.C. |
| | | | | | Zone j<br>Zone k | | | | | | | | | | | | | | | | | | 20,000 B.C. |

Table III. Sequences of excavated and surface pre-ceramic and early ceramic components in the environmental zones of the Ayacucho Basin.



SETTLEMENT PATTERN

Summer (January-March) Microband Camp

Fall (April-June) Microband Camp

Winter (July-September) Microband Camp

Spring (October-December) Microband Camp

SUBSISTENCE ACTIVITIES

Hunting

Trapping

Guinea Pig Domestication

Plant Collecting

Figure 4. An isometric view from the south of the southern part of the Ayacucho Basin showing the reconstructed settlement and subsistence patterns during Period 4: 7000 - 5500 B.C.

was then a woodland zone. The presence of grinding stones in them suggests that they were also wet season occupations.

Evidence indicates that the populations of this region moved from one micro-environment to another as the seasonal food resources of each zone became available. They exploited these resources with different subsistence techniques, and their diet varied somewhat from one season to the next. It is clear that the inhabitants of the region were not only experimenting with and perfecting their techniques for acquiring both plant and animal foods but were also gaining a much greater knowledge of their ecosystem as a whole.

## Interactions

The inhabitants of each region were beginning to develop slightly different economic orientations. At the same time, they were bound together by an exchange network that provided everyone with raw materials, food resources, and technological ideas. The widespread use of obsidian in the highland regions provides evidence for the continued exchange of raw materials. Coastal shells and jicama roots occurred in Tres Ventana indicating exchange of foods. The close similarity of the tool kits in the three highland regions and the greatly increased resemblance of coastal tools to highland ones suggest that flint-knapping techniques and presumably hunting techniques were shared throughout the entire area. Gourd was introduced to the coast and in Ayacucho perhaps from the Selva while achiote and tree gourd were brought to the Ayacucho-Huanta Region from their native habitats in the tropical lowlands.

## Period 5: 5500 - 4200 B.C.

Four distinctive features stand out during this period. First there is incredible variation in the settlement-subsistence systems, even in the same region. Second, the kinds of variation that exist in these systems in one region are very different from those that exist in the other regions. Third, there is the first clear evidence for domestication of plants and animals in two of the highland regions. Fourth, the use of wide variety of plant species began to appear in it. This is not particularly surprising since all of the available evidence indicates that the inhabitants of each region probably participated simultaneously in several more or less independent interaction spheres. Fifth, there was some lag involved in the spread of ideas and commodities from one region to another. The duration of this lag was highly variable and depended not only on the item involved but also on the inhabitants of the regions involved.

## The Ancon-Chilca Region

Occupation sites containing artifacts of the Canario Complex have been found in all of the areas between Ancon and the Chilca Valley (Patterson 1971). The Canario sites in the Lurin and Chilca Valleys date from 5300 to 4200 B.C., while those to the north are

somewhat later, dating from ca. 5000 to 4200 B.C., and are preceded by Luz Complex (5300-5000 B.C.) occupations in the interfluvial area between Ancon and the lower Chillon Valley and near Cajamarquilla in the Rimac Valley.

Subsistence was based on collecting wild plants from the lomas during the wet season and valley floor resource areas during the dry season. Hunting, shellfish gathering, and fishing (possibly only in the Lurin Valley) occurred throughout the year.

The proximity of seasonal food resource areas played a major role in determining the location and permanency of settlements on the central coast. In the few localities where all of the resource areas are close to each other, permanent settlements occurred. A clear example of this pattern occurred in the southwest corner of the Lurin Valley and in the Paloma quebrada of the Chilca Valley where the inhabitants exploited all of the seasonal and permanent food resources from a single location that was occupied continuously throughout the year. While the Lurin may have been a base camp, the Paloma site was a hamlet with a number of oval pithouses (Engel 1971).

Two sites located in the lomas, one in the Lurin-Chilca interfluvial area and the other on the north side of the Lurin Valley, have yielded radiocarbon dates of ca. 5000 B.C.

When the seasonal resource areas were too widely separated from each other to be conveniently exploited from a single locality, the populations lived in wet-season camps along the rivers or on the valley floors. The one dry-season camp known from the area is located in the lower part of the Chilca Valley, which has never been extensively farmed, a fact that probably accounts for the preservation of the site. It may well have been paired with the wet-season settlement in the Lurin-Chilca interfluvial area mentioned above. Wet-season camps at Ancon were presumably paired with dry-season camps in the Chillon Valley that have been destroyed either by nearly 4000 years of intensive cultivation or the encroachment of modern industries from Lima.

### The Huarochiri Region

The upper levels of the Tres Ventanas Cave, as well as another located nearby, have yielded abundant remains of projectile points and scrapers similar to those of the Canario Complex (Engel 1970). Furthermore, radio carbon measurements date these remains to this period. Again, marine molluscs and plant remains in the refuse indicates contact with the coast, either through exchange or some sort of seasonal transhumance pattern. The settlement and subsistence patterns of the region are not clear; however, they do not seem to have differed significantly from those of the preceding period.

## The Huancayo-Junin Region

Artifacts belonging to the Pachamachay Complex have been recovered from the upper levels of Pachamachay Cave and from Curimachay and Tilarnioc Caves. The complex is dated to this period on the basis of the similarities between its chipped stone artifacts and those of the Piki Complex in the Ayacucho-Huanta Region; however, it lacks most of the grinding tools and scraper types occurring in the latter. The fact that the caves occur in different micro-environments suggests that the inhabitants of the region followed some kind of seasonal round that related to the movement of animals, particularly camelids. Perhaps the most significant aspect of this period is some evidence of domesticated or tamed llama and probably alpaca among the vast quantity of camelid bones in the upper layers of Pachamachay Cave.

## The Ayacucho-Huanta Region

Artifacts belonging to the Piki Complex (5800-4550 B.C.) were recovered from 18 surface sites and seven excavated caves which yielded 24 living floors (MacNeish, Nelken and Cook 1970). These sites are located in all of the environmental zones of the region. Furthermore, five excavated components containing early Chihua Complex (4550-4200 B.C.) artifacts are also relevant to this discussion. All of the excavated Piki and Chihua components contained faunal remains of particular importance; in addition, there were nine preserved human feces and several identifiable plant remains.

Dry-season camps were represented at two excavated sites in the low puna, one in the humid woodlands, and another in the Riverine thorn scrub, where the inhabitants supplemented their predominantly meat protein diets with plant foods presumably collected in much the same way as they were in the preceding period. However, a series of seven wet-season (November-March) living floors excavated in Pikimachay Cave located in the slightly wetter dry thorn scrub zone, represented a sequence of microband occupations, and yielded a very different subsistence pattern. There were very few bones of either large or small mammals in these layers, but the presence of wild seeds, gourd remains, and the seeds of domesticated quinoa, and squash suggest a wet-season subsistence pattern based mainly on plant collecting and agriculture, incipient as it may have been, where hunting and trapping were of little importance. Two microband camps, one in a canyon in the present-day dry thorn forest (pollen indicates it was then woodland) and another in a cave in the lower part of the humid woodlands, contained relatively few bones, grinding stones, and some seeds; the inhabitants of these localities may have had a similar incipient agricultural subsistence pattern as those of Pikimachay Cave. One of these contained the remains of a tree gourd. A third subsistence system is represented in a series of 18 microband living floors excavated at Puente Cave in the Riverine thorn scrub. Twelve floors showed clear evidence of wet-season occupation; all of them contained a few camelid or deer bones and hundreds of small mammal

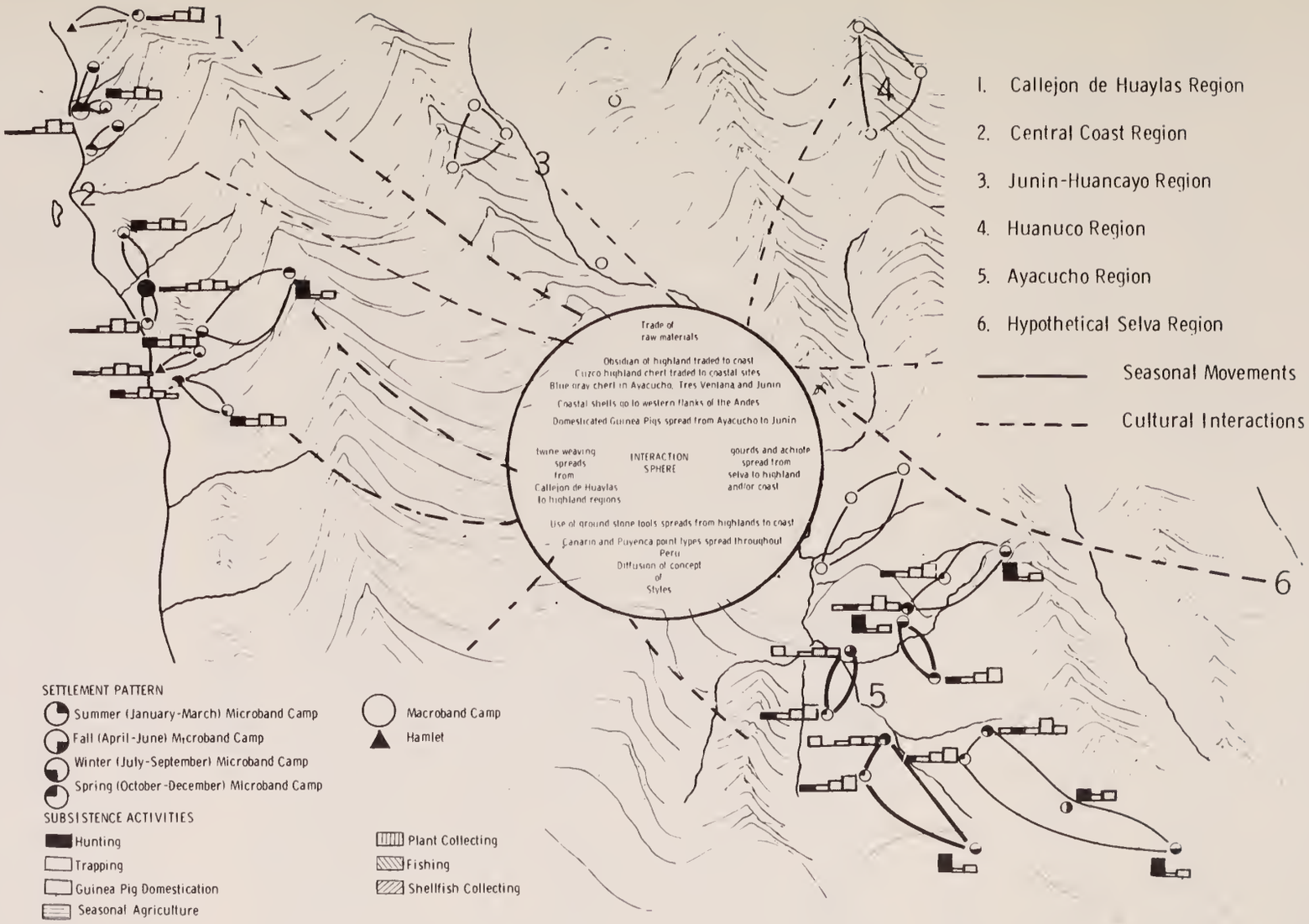

1. Callejon de Huaylas Region
2. Central Coast Region
3. Junin-Huancayo Region
4. Huanuco Region
5. Ayacucho Region
6. Hypothetical Selva Region
Seasonal Movements
Cultural Interactions
Trade of raw materials
Obsidian of highland traded to coast
Cuzco highland chert traded to coastal sites
Blue gray chert in Ayacucho, Tres Ventana and Junin
Coastal shells go to western flanks of the Andes
Domesticated Guinea Pigs spread from Ayacucho to Junin
twine weaving spreads from Callejon de Huaylas to highland regions
INTERACTION SPHERE
gourds and achiote spread from selva to highland and/or coast
Use of ground stone tools spreads from highlands to coast
Canario and Puyenca point types spread throughout Peru
Diffusion of concept of Styles
SETTLEMENT PATTERN
Summer (January-March) Microband Camp
Fall (April-June) Microband Camp
Winter (July-September) Microband Camp
Spring (October-December) Microband Camp
Macroband Camp
Hamlet
SUBSISTENCE ACTIVITIES
Hunting
Trapping
Guinea Pig Domestication
Seasonal Agriculture
Plant Collecting
Fishing
Shellfish Collecting

Figure 5. An isometric view from the south of the Central Peruvian Interaction Sphere showing the reconstructed settlement and subsistence patterns during Period 5: 5500 - 4200 B.C.

bones, including those of seemingly tamed guinea pig. Many of them also yielded grinding stones, pebble rocker manos, majuna for digging sticks, and unidentified charred seeds. This subsistence system was apparently composed of trapping and guinea pig penning, some plant collecting and/or incipient agriculture, and little, if any, hunting.

During this period, there was a calendar-round cycle in which populations shifted their camps from one micro-environment to another as the seasonal resources of each became available. The subsistence activities practiced during each season and in each micro-environment were different. Furthermore, there was a continually increasing tendency for wet-season camps to become larger in size and longer in duration as storeable domesticated plants and guinea pigs played continually growing roles in consumption patterns.

Interactions

The data for widespread contacts among the various regions of central Peru are even more abundant and convincing than they were for the preceding period. Obsidian artifacts occur in all four regions. Coastal shells and plants in Tres Ventanas came from the coast. The inhabitants of the central coast during the time of the Luz Phase were borrowing ideas about projectile point styles that seem to have their antecedents in the Pampa de Paijan Complexes of the north coast, and they were utilizing, on a small scale at least, a very distinctive kind of chert known only from the Cuzco region to make blades. The tree gourds, gourds, and possibly squashes in the Ayacucho-Huanta Region were all imported from elsewhere. It is in this period that lima and common beans occur in Guitarrero Cave, II b-e (Kaplan, Lynch and Smith 1973), and there is a possibility that camelid were domesticated near Junin and guinea pig in the Ayacucho region; but these do not start to spread until the next period (Wing nd.). The chipped stone tools in assemblages belonging to the Canario, Late Tres Ventanas, Late Pachamachay, and Piki Complexes show many similarities. Furthermore, the ground stone tools of the coastal Canario Complex resemble those of the earlier Jaywa Complex in the highlands.

## Period 6: 4200 - 2500 B.C.

This period has several outstanding characteristics. First, there is still considerable intra-regional variation in settlement-subsistence systems. Second, the amount of inter-regional variation in settlement-subsistence is significantly greater than it was in the preceding period. Third, agricultural production begins to play a continuously increasing role in the subsistence activities of populations living at medium elevations in the highlands, while animal husbandry seems to be increasingly important in the activities of populations living at higher elevations in the Andes. Fourth, a greater quantity and variety of domesticated plant and animal species were exchanged between the four regions than in the preceding period, and new plants were brought in from outside regions.

## The Ancon-Chilca Region

Wet-season camps containing artifacts of the Corbina Complex (4200-3570 B.C.) have been found in the lomas near Ancon. The fact that the contemporary Lachay Complex from the Rio Seco region, about 70 kilometers to the north, has a slightly different range of tool types suggests that there was local technological variation on the central coast during this five-century period. Encanto Complex (3750-2500 B.C.) sites have been found at Ancon and in the Lurin and Chilca Valleys.

Subsistence was based on wild plants, hunting, shellfish gathering, and fishing, which was much more important than it had been during the preceding period. After ca. 3000 B.C., two species of cultivated squash (C. ficifolia and C. moschata) and one wild species (C. andreana) were added to the diet of the Ancon-Chillon population.

The proximity of seasonal food resources continued to play the major role in determining the location and permanency of settlements. Chilca Monument I was an Encanto village occupied continuously throughout the year because of the spacing of resource areas in the lower Chilca Valley (Engel 1966). Virtually all of the resource areas exploited by this population were contiguous with each other. Seasonal resource areas in the Ancon-Chillon region were not contiguous, and the population continued to reside in separate wet- and dry-season camps. Cultivated squash from an Encanto wet-season camp, located in an area where agriculture could not have been practiced under any conditions, indicates that the population used the valley floor environments for limited farming. The presence of a camelid perhaps tamed guanaco, at the same camp suggests that this group has at least some contact with highland populations.

It seems likely that the growing reliance on fish, the continuing reliance on flour from wild grass seeds, and the new reliance on cultivated squashes during the later part of the Encanto Phase apparently increased the nutritional level of some central coastal groups, which ultimately set off a period of sustained population growth at a time when the prevailing climatic conditions were effectively reducing the size and extent of the lomas.

## The Huarochiri Region

Isolated projectile points, which resemble those of better known and dated complexes in the highlands, have been collected at several localities. They indicate that the region was inhabited at least on a seasonal basis during this period, but they tell us virtually nothing about settlement and subsistence patterns, except that hunting played some role in the subsistence economy of the region.

## The Huancayo-Junin Region

Surface collections indicate that the region was inhabited during

this period; however, only one site has been excavated--Tilarnioc Cave, the upper levels of which yielded domesticated llama and alpaca bones and possibly some tamed guinea pig remains. The available evidence is slim but suggests that herding was probably important--perhaps more important than in any other region in central Peru; otherwise, little if anything, can be said about the settlement-subsistence system of the region.

## The Ayacucho-Huanta Region

Eight excavated and 29 surface sites with artifacts belonging to the middle and late Chihua Complex (4200-3100 B.C.) and four early living floors with early Cachi Complex (3100-2500 B.C.) artifacts are germane to the discussion of this period. Three components excavated in the low puna environmental zone indicate that the older system of microband dry-season camps where hunting was important continued; however, there is one piece of evidence (a human feces containing a possible potato eye and hoe fragment) that suggests the inhabitants of these localities were supplementing their diets with agricultural produce grown during the dry season. One site in high puna was found in survey. An excavated living floor from the humid woodlands yielded a hoe, grinding stone, and a few large mammal bones suggesting the subsistence patterns of this environmental zone were much the same as the ones described above. Information from the dry thorn scrub environmental zone shows different subsistence patterns. Here, there is evidence of potato-growing, domesticated corn, squash, gourd, common beans, lucuma, quinoa and perhaps coca, all of which are associated with the remains of a few domesticated guinea pigs, a few large mammal bones, and wild plants. The sites in these micro-environmental zones are mainly wet-season camps, a few of which extend well into the dry season; furthermore, a few of the surface sites are large enough to be considered macroband camps. Still another subsistence pattern is represented at sites located in the Riverine thorn scrub zone. Small excavated floors produced some guinea pig remains, a few large mammal bones, relatively large numbers of scraper planes, digging tools, and seed-grinding implements. These sites were apparently occupied during various seasons.

The evidence suggests the most important settlement unit was the base camp in the Riverine or dry thorn scrub zones with an agricultural or horticultural system that permitted groups to grow limited food surpluses during the wet season. These surpluses were not large enough to last the entire year, so groups supplemented them by hunting in the humid woodlands and upper and lower puna zones and by collecting in the dry thorn scrub zones.

## Interactions

Food remains provide the evidence for exchange between the regions during this period. The tamed camelids, perhaps representing incipient herding, found on the coast as well as the meager evidence of such in Ayacucho, probably came originally from the Huancayo-Junin

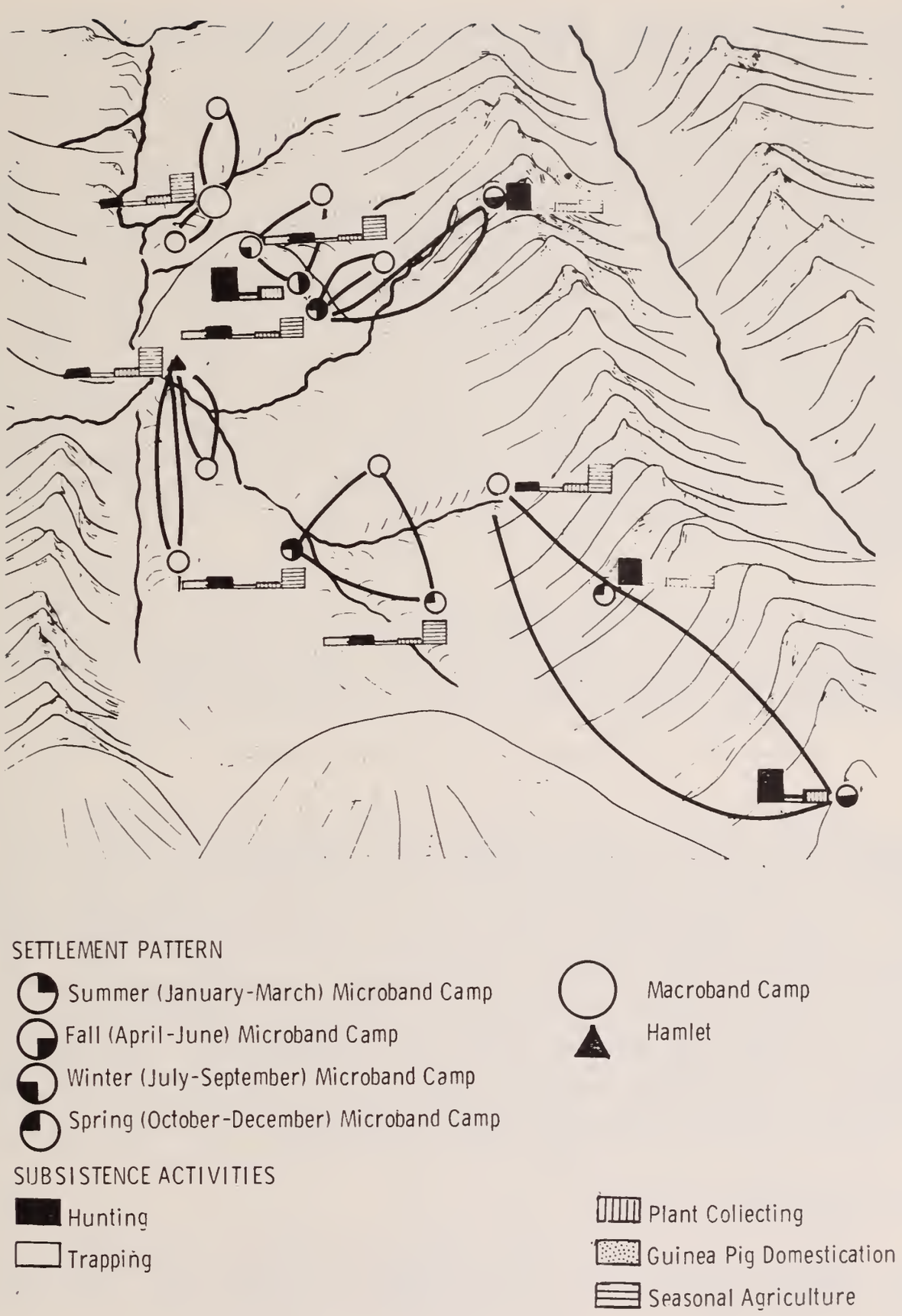



Figure 6. An isometric view from the south of the Ayacucho Basin showing the reconstructed settlement and subsistence patterns during Period 6: 4200 - 2500 B.C.

Region of the highlands. The bones of tamed guinea pigs from the Junin caves as well as the coast may have spread from the Ayacucho-Huanta Region as did the cucurbits. Common beans may have spread in from centers like the Callejon de Huaylas to Ayacucho, while the latter's potatoes may have come from the south highland zone. The Ayacucho corn perhaps moved in from the north, although the evidence of teocinte intergression in these cobs suggests its ultimate origin was Mesoamerica. The lucuma and coca in the Ayacucho components in all probability came from some Selva or Montana region or regions. In fact, the presence of these Selva plants in Ayacucho plus the earlier evidence of cucurbita crescentia (tree gourds) and achiote as well as the presence in this same period of a number of other domesticates that grow in the tropics, such as beans and cucurbits, may be a far more secure basis for reconstructing the earliest plant domestication in the tropical lowlands than speculations based upon the presence of an undomesticated species of Manihot in Mesoamerica, age-area hypotheses based on modern plant distribution of tropical cultigens or guesses about early transatlantic diffusions or flights of fancy.

Other evidence of interactions are the presence of foreign raw materials in each of these regions as well as common use of similar artifact types, such as small leaf and triangular points, rocker manos, and majanas and various kinds of twined weaving.

## Period 7: 2500 - 1750 B.C.

Perhaps the most significant feature of this period was that the inhabitants of the various regions were beginning to work out the ideal of community self-sufficiency in different ways. In at least exchange networks that linked together populations which were residing more or less permanently in different environmental zones and were exploiting the food resources immediately available to them. The period also has other important features. First, the amount of intra-regional and inter-regional variation in settlement-subsistence has not changed significantly from the preceding one. Second, the variety of foodstuffs exchanged between the regions appears to have increased significantly from earlier times. Finally, the whole tempo of cultural change has increased considerably.

### The Ancon-Chilca Region

This was a period of rapid cultural change on the central coast. The cultural sequence for the Ancon-Chillon sector is: the Pampa Phase (2500-2300 B.C.), Playa Hermosa Phase (2300-2100 B.C.), Conchas Phase (2100-1900 B.C.), and Cayiota Phase (1900-1750 B.C.). The three earlier phases are known only from the Ancon-Chillon sector at the present time. Gaviota Phase occupation sites occur not only in this sector but also in the Rimac and Lurin Valleys. For descriptive purposes, it is convenient to divide the period into earlier (2500-1900 B.C.) and later (1900-1750 B.C.) parts.

A major change that occurred at the beginning of this period was how populations spaced themselves with respect to the resources they were exploiting in order to maintain their self-sufficiency. Previously, many resources were utilized on a calendar-round basis, with the population moving from one resource area to the next as the resources of each became seasonally available. This involved the actual movement of populations when the resource areas were widely separated from each other or exploiting areas in different directions from the same base camp or hamlets when the resources were contiguous with each other, as they were in Chilca and Lurin. During the earlier part of the period, the location and permanency of settlements were governed by other factors--the availability of marine products and the availability of arable land in the lower parts of the valley that could be farmed during the dry-season. Large year-round fishing villages were established in the immediate vicinity of rich fishing grounds and shellfish beds at Ancon and Ventanilla--which are located in the coastal desert zone where agriculture cannot be practiced under any conditions. Small, year-round hamlets were established in areas of the Chillon Valley, where single-crop farming could be carried on. What had formerly been one population was now divided into two distinct segments: a large coastal fishing group and a small, inland farming group. Both groups apparently remained in or near the same resource area throughout the year, in contrast to what had happened earlier. The fishermen sent marine protein foods into the valley and received cultivated plant foods in return. The self-sufficiency of the original population was maintained through this exchange mechanism.

Cultivated plant foods became increasingly more important during this period (Patterson 1971). Canavalia, achira, pacae, guava, chili peppers, corn, lima beans, lucuma, and sweet potatoes appeared during the early part of the period. These plants were largely, if not entirely, first brought under domestication elsewhere and were then imported into the central coastal region. This is also true for peanuts and coca--the two cultigens that appeared during the later part of the period. Cultivated plants became much more important dietary items after 1900 B.C., judging by (1) the significant increase in both the quantity and variety of cultivated plants found in refuse deposits at coastal fishing settlements, (2) the tremendous increase in the proportion of the total population that resided in the valley where farming could be practiced, (3) the appearance of small hamlets in the middle parts of the river valleys where the prevailing environmental conditions favor the high productivity of certain crops--particularly coca--and (4) the appearance of these middle valley crops in low valley and coastal settlements.

During the early part of the period, settlement size was governed largely by proximity to marine resource areas. Consequently, the larger proportion of the population lived in coastal fishing villages and the smaller proportion near agricultural lands in the low valley. By the later part of the period, another factor--the position of the settlement in the exchange network--played an equally important role

in determining settlement size. Consequently, the largest sites were those that had (1) a "monopoly" on marine products, (2) a central position in the exchange network, or (3) both. The major settlement in each valley exchange system--Chuquitanta, Rio Seco, Canto Grande, and Pachacamac--all have large public architecture (Engel 1966).

The population of the Ancon-Chillon sector grew steadily during this period from an estimated 50 individuals at ca. 3000 B.C. to more than 1500 by the time of the Gaviota Phase. Similar rates of population growth probably occurred in both the Rimac and Lurin Valleys, where substantial numbers of Gaviota Phase settlements have been found.

The existence of Gaviota Phase farming hamlets in the middle parts of the Rimac and Lurin Valleys has interesting implications concerning the agricultural technology of this coastal region. Given the gradients of the rivers and the amount of postglacial river cutting that has occurred, it is virtually impossible to farm anywhere in the middle elevations of these valleys without some form of water diversion system. The locations of the four middle valley settlements discovered so far suggest that short canals were used to divert water from the rivers to areas where arable land was available. The location of farming settlements in the lower parts of the Chillon, Rimac, and Lurin Valleys does not suggest that water diversion systems were being used in the low valleys.

### The Huarochiri Region

No sites to this period have been excavated, but surface collections of isolated projectile points indicate that the region was inhabited. There are some non-ceramic sites in the region, which may date to this period.

### The Huancayo-Junin Region

A large number of sites dating to the second half of the local Tinyari Phase date to this period. Seasonal utilization of different environmental zones continued. Wet-season base camps are situated in riverine or lacustrine zones, such as the sites of San Juan Pata, Tinyari, and the Ledig-Tschopik shelters in the Valley near Jauja and Huancayo. Dry-season camps of these semi-nomadic herders are characterized by a series of high altitude caves on the puna, such as Pachamachay, Cuchimachay, Tilarnyoc, Pintadomachay, and Pachacutec. Subsistence appears to have been mainly based on herding, hunting, with minimal agriculture.

Projectile points excavated from the lower levels of an open site near San Glas as well as those of the Tinyari Phase sites near Jauja and Huancayo are nearly identical to those of the Cachi Phase in the Ayacucho-Huanta Region. However, the rest of the artifact assemblage, particularly the bone implements, are much more similar to Mito Phase

implements in Huanuco. The excavation revealed a typical wet-season base camp, a fairly large village with a subsistence orientation based mainly on llama-herding and hunting, with minimal farming.

## The Ayacucho-Huanta Region

Sites belonging to the middle and later parts of the Cachi Phase (3100-ca. 1750 B.C.) date to this drier period. The population seems to have increased from the preceding period (29 to 46 sites), and two new settlement-subsistence systems have emerged. The major system occurs in the puna and the adjacent humid scrub forest and was based on a seasonal subsistence system involving llama-herding and potato farming in these zones. Mammal bones and artifacts from excavated components indicate that groups went to the high puna during the dry-season to herd tamed guanaco and hunt and then moved to the low puna or humid woodlands during the wet-season to grow potatoes with a corresponding de-emphasis of herding and hunting activities. This life style was linked--probably through kinship and ritual ties that served economic functions--to the major settlement-subsistence system (38 components) which took place at lower elevations, where camelid bones are only occasionally found in excavation.

Of particular importance in the lower settlement-subsistence system were seven or eight sites with architectural features, including three with agricultural terraces. These were probably hamlets that were occupied continuously throughout the year. The other lower elevation sites, including the 12 excavated components from caves, seem to be seasonal camps occupied sporadically by groups going out from the hamlets to plant, harvest, collect, hunt, and trap. Foodstuffs from the cave components include corn, squash, beans, gourd, tara, and lucuma, and possibly pepper, quinoa, and achira, as well as domesticated guinea pig, camelid, deer, and small mammal bones.

The minor settlement-subsistence system involved seasonal residence in different high-altitude localities and subsistence activities based on herding and root-crop farming. The major settlement-subsistence system involved permanent residence with occasional forays away from the hamlet and subsistence activities focused primarily around agriculture. The two systems were linked together by an exchange network--a vertical economy. Basically, this pattern has persisted to the present day in the Ayacucho-Huanta Region.

## Interactions

Food remains again provide the best evidence for exchange between the various regions, as they did in the preceding period. Herding tamed camelid spread northward to Kotosh and presumably westward to the Huarochiri and Ancon-Chilca Regions. Tamed guinea pigs were also raised at Kotosh and at Culebras, a large settlement on the north-central coast. Achira, lima beans, and cotton, along with the techniques for making twined cloth had probably spread to the highland valleys. Coca, corn, chili peppers, and common beans had spread

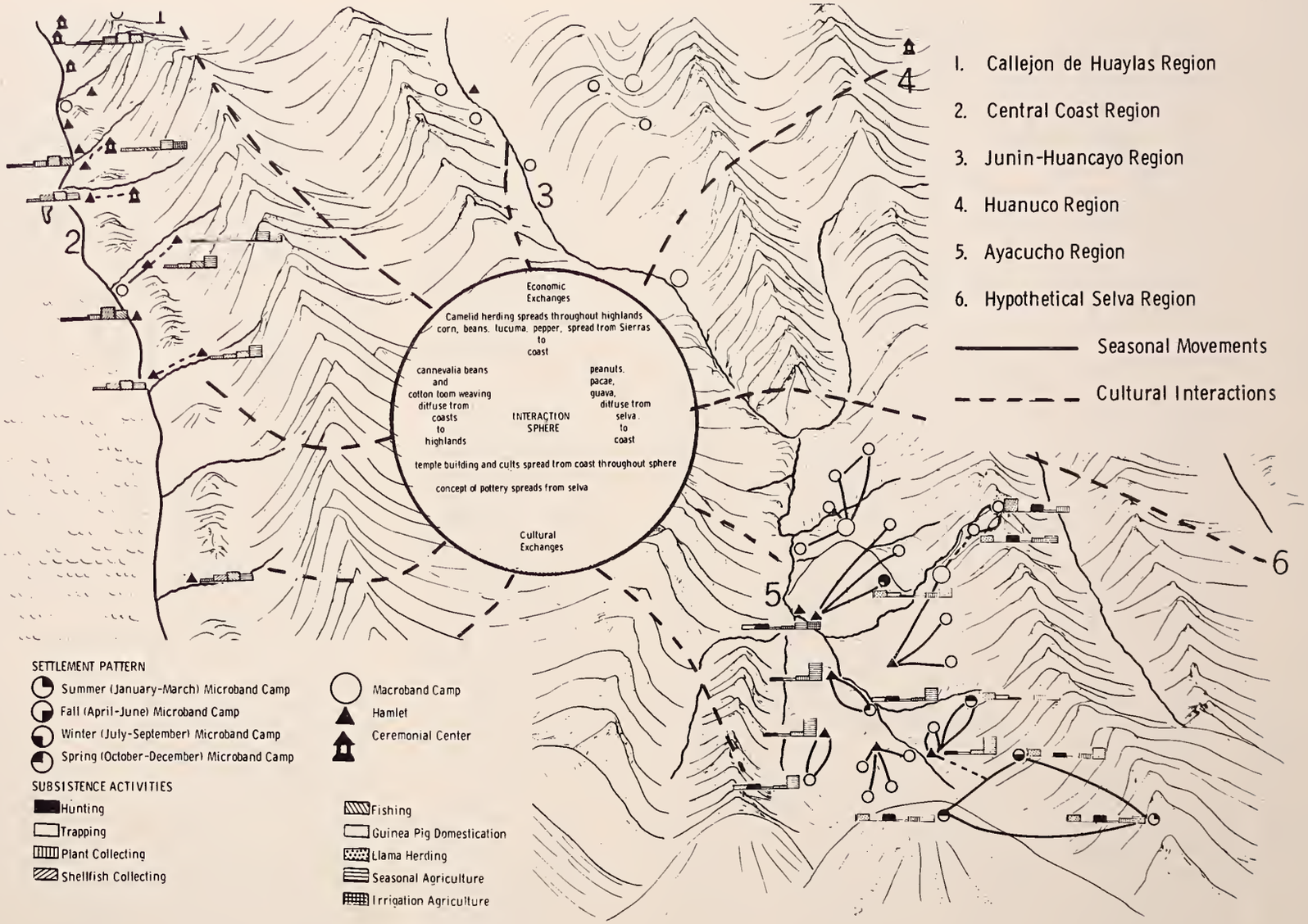



Figure 7. An isometric view from the south of the Central Peruvian Interaction Sphere showing the reconstructed settlement and subsistence patterns during Period 7: 2500 - 1750 B.C.

to the coast from various highland regions. It is also conceivable that some of these plants may have spread eastward to the montana and selva, for a number of domesticated species with presumed tropical lowland origins--guava, lucuma, sweet potatoes, peanuts, and perhaps avocado--appeared on the coast during this period. These tropical lowland domesticates provide a few hints about the developing subsistence patterns of that region during the second and third millenia B.C. Further, the earlier use of highland potatoes and this later occurrence of tropical root crops, such as sweet potatoes and the use of manioc at a still later period, is the only dated archaeological evidence we have concerning the spread of the concepts of utilizing root crops. This evidence, meager as it may be, indicates a diffusion of root-crop agriculture or horticulture from the highlands to the lowlands, rather than the reverse, the latter of which is an unfounded speculation that occurs in the literature concerning early South American agriculture ad nauseam. (Lathrap 1970)

Before this time, obsidian and other raw materials from the highlands used for making stone occurred only sporadically on the coast, just often enough to show that exchange was taking place between the various regions. Duing this period, however, many of the chipped stone tools, particularly projectile points, were made on the coast from obsidian acquired in the highlands. This pattern may have appeared somewhat later on the central coast than it did on the south coast, located almost due west of extensive obsidian deposits in the south highlands, some of which occur in the Huancavalica region next to the Ayacucho-Huanta region.

Agricultural products and raw materials were not the only commodities moving throughout the whole interaction sphere. There are hints that ideas about weaving, architecture, water-control systems, herding, and wool production, and perhaps ceremonial or religious practices, were also becoming more widespread. The general impression of this period is that the whole tempo of exchange had speeded up considerably and that central Peru was being welded into a single area.

## Period 8: 1750 - 1050 B.C.

During this period the coastal region contributed ideas about public architecture and how community self-sufficiency should be organized to at least one of the highland regions in central Peru. The idea of exchange centers with public architecture which link together a number of economically specialized populations into a single economic system occurred earlier on the coast and appeared for the first time in the Ayacucho-Huanta Region. At this time the coastal exchange networks were considerably larger than those in the highland regions of central Peru. In addition, foodstuffs, raw materials, and technological innovations continued to spread from one region to another. Further, it in is this period that the use of pottery entered the regions under discussion, perhaps ultimately from lowland, more tropical sources (Lathrap 1970).

## The Ancon-Chilca Region

Pottery belonging to one of the brownware styles (1750-ca. 1400 B.C.) occurs throughout the region during the first half of the period. In the later half, the Colinas style (ca. 1400-1050 B.C.) occurs mainly in the northern sector, and the Curayacu style (ca. 1200-1050 B.C.) predominates in the southern sector. The stylistic differences between the two sectors in the later part of the period have important implications concerning the number of semi-independent exchange networks that were operating in the region as a whole. Therefore, it is again convenient to distinguish between the earlier and later parts of the period, using ca. 1400 B.C. as the dividing date.

The major settlements on the coastal plain during the preceding period were apparently all abandoned and replaced by new ones featuring single large pyramids. Judging by both size of the pyramid and extent of the habitation area, the most important settlement in the entire region was La Florida, located about 11 kilometers from the ocean in the lower Rimac Valley and a few kilometers from the old exchange center at Canto Grande. It seems likely that the bulk of the populations from both Chuquitanta and Canto Grande were incorporated into a single one centered at La Florida during the early part of this period. There was a subsidiary population center with a pyramid at Mina Perdida in the lower Lurin Valley. In addition, there were numerous economically specialized hamlets located in the lower and middle parts of the Lurin and Rimac Valleys as well as at Ancon. Site locations, as well as the contents of habitation refuse deposits, have a number of implications concerning subsistence activities.

La Florida, the largest settlement in the region, is located in a place where agriculture cannot be practiced without some sort of water management system because of the amount of postglacial river-cutting occurring in this part of the valley. Without going into the specific details of the argument, it is highly likely that the La Florida population utilized a water-control system composed minimally of a single canal--four to six kilometers in length--which would have roughly quadrupled the amount of arable land available; however, there was probably even more land under cultivation than before. In addition to the small farming hamlets in the middle parts of the Rimac and Lurin Valleys, there are small hamlets in localities in the lower Chillon and Rimac Valleys where single crop riverbank as well as agriculture could have been practiced. The largest segment of the low valley populations in the Rimac and Lurin Valleys utilized water management systems; small segments of the low valley populations continued to farm along the riverbanks in the traditional way. Middle-sized segments of the populations continued to specialize in fishing and shellfish gathering. All of the population segments were linked together by an exchange network. The major network on the central coast was dominated by La Florida and probably included hamlets in the middle parts of both the Chillon and Rimac Valleys. Ceramic similarities between the Lurin Valley and those immediately to the

north suggest the exchange network of this valley was linked with the La Florida network. In other words, there is some evidence indicating the existence of a multi-valley exchange system during the early part of this period.

The large population centers were abandoned about 1400 B.C., and new ones were built in localities where even larger amounts of arable land could be brought under cultivation with the use of simple water-control systems. Public architecture occurred at all of the larger settlements and at several of the smaller ones, including the fishing village at Ancon. However, the major difference between the first and second halves of the period involved the number of independent exchange networks operating in the region. The distribution of ceramic styles after 1400 B.C. indicates that there were two exchange networks, towards the end of the period, judging by the fact that Curayacu pottery has been found in the northern sector and that Colinas pottery occurs occasionally in the southern one.

## The Huarochiri Region

Two isolated projectile points found on the surface indicate that the region was inhabited during this period and suggest that hunting probably played some role in the subsistence economy of its inhabitants.

## The Huancayo-Junin Region

Although sites with ceramic styles belonging to the first half of this period have not yet been certainly identified, sites with ceramic styles belonging to the second half (1400-1050 B.C.) have been identified and excavated. Two distinct ceramic styles occur. In the northern sector a yet unnamed style which bears similarities to the Kotosh Warijirca and Kotosh-Kotosh styles of the Huanuco Region (Izumi and Terada 1972) and also to the Pangotsi style of Casa de la Tia, has been found at a site near Tarma and also is said to be found at various sites near Lake Junin, including an excavated salt site near San Blas.

In the southern sector the Pirwaouquio style (1300-650 B.C.) predominates. The lower excavated levels of Ataura near Jauja and of the type of site near Huancayo share ceramic features with the Colinas and the Curayacu styles on the Central Coast, with temporally equivalent phases at Kotosh, Casa de la Tia, and with Wichqana near Ayacucho, as well as a number of more general traits with a number of other contiguous zones.

The distinctions between a northern and a southern sector and the technological borrowing from the coast and selva as well as from highland neighbors are important ones. In earlier periods we had insufficient evidence to distinguish the ethnic groups utilizing the puna zone around Lake Junin from those in the upper reaches of the Mantaro near Jauja and Huancayo. In these earlier epochs there

existed a fairly broad continuum of similarities between the Huancayo-Junin and the Ayacucho-Huanta Regions. By Period 7 (3500-1750 B.C.), even though there remains general similarities in projectile point types between the Ayacucho-Huanta Region and the Junin-Huancayo Region, there are a number of other features of the artifact assemblage which are shared between the Huancayo-Junin and the Kotosh-Huanuco Regions that are not apparently found in the Ayacucho-Huanta Region. Economic orientation and social interaction is thus most strongly directed toward surrounding highland herding groups. During Period 8 (1750-1050 B.C.) the northern sector becomes closely tied with the economic network joining Kotosh and other northern highland sites, while the southern sector remains more firmly attached to a Central Andean economic interaction sphere.

Economic networks between the Jauja-Huancayo basin and other areas are much easier to detail for subsequent phases but were clearly well-developed between highland and coast, highland and selva, and highland and highland even at this time. Pottery features indicate interaction of highland llama caravan trains with the selva to the north and east for coca and other selva products, with the coast to the west for spondylus shell, whalebone, corn, and so forth, and with the farmers to the south in the higlands for potatoes and other farm produce.

The Jauja-Huancayo basin contained one larger seasonal village, persumably the locus of political power, and a series of subsidiary wet-season villages. The nomadic demands of herding apparently precluded interest in elaborate temple or cult centers seen elsewhere in Peru at this time. Semi-nomadic pastoralism with secondary herding and horticulture continued to be the major subsistence pattern throughout much of this area.

## The Ayacucho-Huanta Region

The Andamarka (1750-1300 B.C.) and Wichqana (1300-400 B.C.) ceramic styles occur during this continuing dry period. The meager food remains associated with these pottery styles suggests that the subsistence patterns of this period were much the same as they were in the preceding one.

Information from two excavated components and a surface collection suggests that the high-elevation, semi-nomadic seasonal settlement pattern and herding-farming subsistence system remained relatively unchanged. However, data from sites located at lower elevations indicate there were new developments in this part of the region. The few food remains indicate that the subsistence patterns--basically agriculture--remained the same. The new developments occur mainly in the settlement patterns. First, there are a number of architectural features made with boulder-type masonry; one of these is a truncated pyramid that may have had some sort of ceremonial function. Second, the 36 lower elevation sites cluster in five geographically distinct localities; furthermore, in four, there is a single site with a

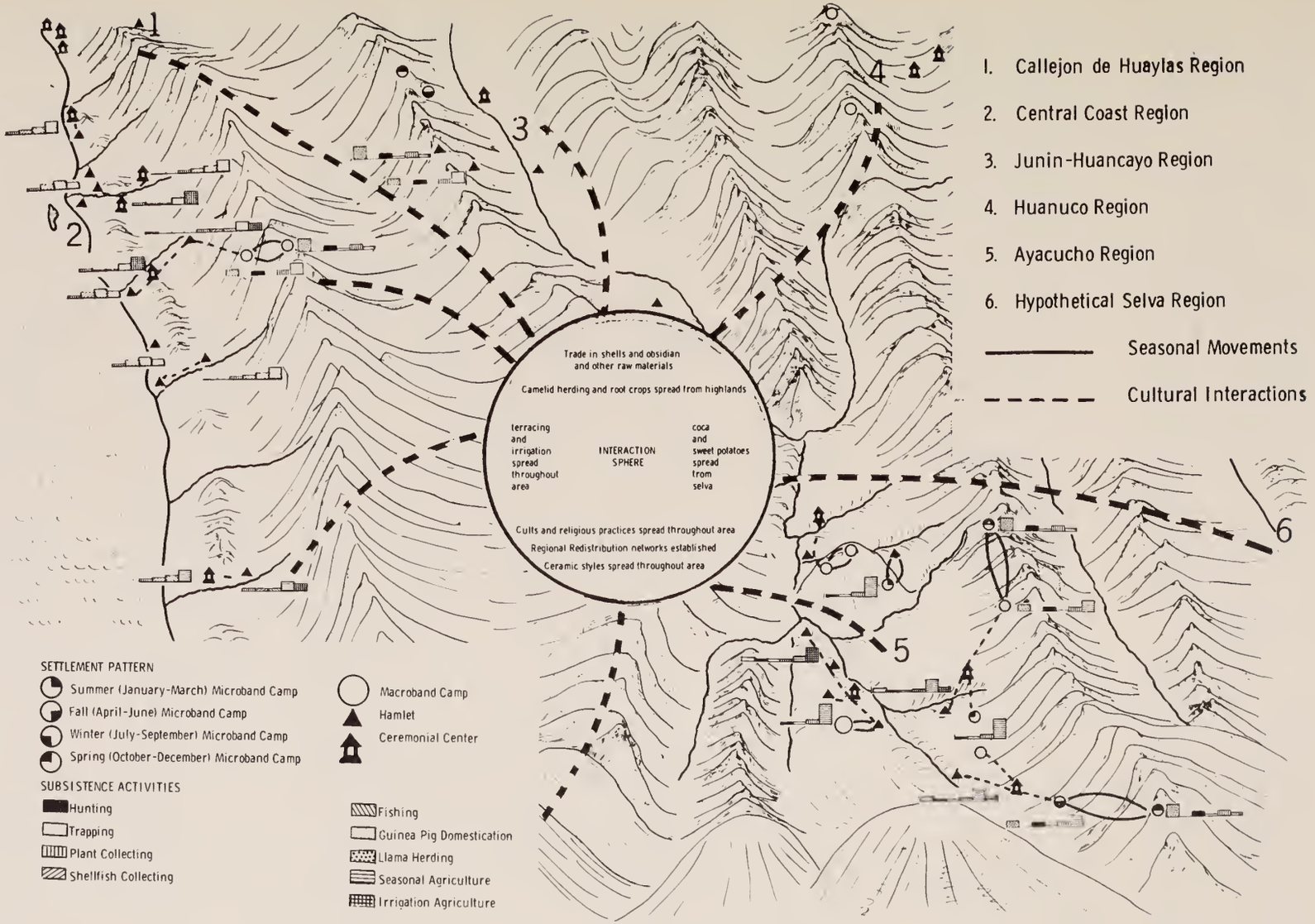



Figure 8. An isometric view from the south of the Central Peruvian Interaction Sphere showing the reconstructed settlement and subsistence patterns during Period 8: 1750 - 1050 B.C.

pyramid and other ceremonial features which served as a center for a series of other kinds of sites including hamlets along waterways both with and without terrace features, open camps, and cave occupations. The clusters of sites around one of these pyramid centers were tied to it by kinship, ceremonial, and economic arrangements. The larger proportion of llama bones in these pyramid centers suggests that they were not only the nuclear centers for farming communities but were also intermediaries between the lower elevation agricultural groups and the high elevation herders and root farmers.

Interactions

The patterns of interaction described for the preceding period continued into this one. The presence of a cebus monkey in a grave on the central coast that dates to the end of the period indicates that there were still important exchanges taking place between the coast and highland regions, on the one hand, and the selva and montana, on the other. Foodstuffs were still being exchanged between the various regions including the tropical lowlands, which now had evolved a root-crop agriculture. Raw materials like obsidian and technological innovations concerning weaving, pottery-making, water management systems, and public architecture also were spreading throughout the central Peruvian sphere.

Perhaps the most significant innovation that spread during the period was concerned with the organization of people. The kind of exchange center that made its appearance in the coastal region about 1900 B.C. occurs in at least one of the highland regions during this period. It consisted of a settlement with a relatively large population which linked together a numer of smaller, more economically specialized settlements into a single settlement-subsistence system. These exchange networks were quite large in the coastal region, occasionally incorporating the inhabitants of several adjacent valleys into a single system, while those that were emerging in the Avacucho-Huanta Region were much smaller in comparison, judging by the fact that there seem to have been at least four distinct networks operating in the area.

## Period 9: 1050 - 450 B.C.

This is the period when the Chavin art style spread throughout much of northern and central Peru. The extent of this spread and the specimens assigned to the Chavin style depend largely on how the style is defined. For the purposes of this paper, Chavin art includes pottery and sculpture that share design features with the stone sculpture at Chavin de Huantar. By this definition, Chavin art occurs on the central coast but not in the central highlands. In other words, there are no specimens from either the Pampa de Junin or the Mantaro Valley and its tributaries that show Chavin influence; however, there are types of pottery from the Ayacucho-Huanta Region, as well as from Huancavelica, that resemble vessels found in direct association with Chavin-influenced pieces on the central coast. It is also clear that

the intensity and duration of Chavin influence in the regions where it occurred varied considerably.

The spread of Chavin has been viewed in terms of the spread of a religious cult that presumably originated somewhere in northern Peru toward the end of the preceding period and was probably centered at Chavin de Huantar by 1100 B.C. From this perspective, the cult spread along major communication routes that connected large nucleated settlements and their satellites in much of northern and central Peru. There is no evidence that military conquest, a later phenomenon in the Central Andes, was involved in this expansion. While this interpretation accounts for many of the patterns of archaeological evidence associated with the spread of Chavin, which resemble those associated with the spread of Christianity, it does raise questions concerning the specific economic mechanisms that were involved and their relationships with economic systems based on the ideal of community self-sufficiency.

It is clear that central Peru was participating simultaneously in at least two different interaction spheres during this period. The first of these is the pre-existing set of networks continuing relatively unchanged from the previous period. The second is a new set of networks set up within the confines of Chavin influence. Within this network the central highlands, at best, participated peripherally with occasional traits diffusing, while the central coast was an integral part of the Chavin interaction sphere with close ties particularly to the north coast, but also with some clear ties to the south coast. This is not particularly surprising, since all of the regions in central Peru had long histories of maintaining independent ties with areas outside of the Central Peruvian Interaction Sphere.

## The Ancon-Chilca Region

A preliminary analysis of materials from the northern sector dating to this period indicates that they can be divided into six chronologically distinct phases, the earliest of which begins about 1100 B.C. Chavin influence appears about this time in the northern half of the region but not until *ca.* 1025 B.C. in the southern half. For the next three and one half centuries, the potters of the region were influenced by what was happening to the north; however, the intensity and nature of the influences on their art was highly variable. Chavin influence was no longer apparent in the region after *ca.* 650 B.C.

The settlement-subsistence systems were essentially the same as they were before, although site locations changed and a number of satellite settlements had public architecture. The largest part of the population participating in an exchange network continued to reside in or near settlements with public architecture located in the lower parts of the river valleys. Middle-sized groups were engaged primarily in fishing and shellfish gathering from coastal villages.

The smallest groups, although considerably larger than they had been in the preceding period, lived in the middle parts of the valleys and were presumably engaged in agriculture.

Garagay, the largest public structure in the lower Chillon-Rimac sector, continued to be used during the early part of the period and possibly the later part as well. Presumably, it was the major exchange center for the population of this region, the fishing villages at Ancon and Ventanilla, and the up-valley farming communities of the Chillon Valley, and possibly the Rimac as well. San Humberto, located at an elevation of 750 meters in the Chillon Valley, had its own pyramid and water reservoir, both of which were built during the early part of the period.

New settlements were established in the Lurin Valley. The major center with public and domestic architecture was located well inland but still in the lower part of the valley. The Huaca Malache, a satellite settlement with domestic architecture and a small pyramid was located in an area where both farming and fishing could be carried on simultaneously; it probably served as a subsidiary center for the low valley and coastal populations of the area. A pyramid and residence complex at Malpase, located at an elevation of roughly 600 meters, was apparently the subsidiary center for the dispersed farming population of the middle valley.

A third exchange network emerged in the region about 800 B.C. and linked populations that lived about the 1,000-meter contour in the Rimac and Lurin Valleys. The occupation in this part of the valleys was much larger than it had been earlier; settlements were generally small and located on alluvial fans along the edges of the valley floors. Evidence from all of the later periods and from ethnohistoric sources indicates that the inhabitants of the upper Lurin Valley were usually affiliated culturally with those of the Huarochiri Region. Presumably, the pattern emerged during this period when the huarochirianos moved into the upper parts of the valleys and began to farm.

### The Huarochiri Region

Two sites are tentatively assigned to the later part of this period on the basis of their ceramics. One is located on the slopes overlooking the modern town of Huarochiri and the other is located on a ridge overlooking the small settlement at Sangallalla. Although evidence concerning the settlement-subsistence system of the region is virtually non-existent, one gets the impression that the inhabitants were farming in the upper valleys and herding llamas and hunting on the punas separating them.

### The Huancayo-Junin Region

Ethnic groups characterized by two ceramic styles, the latter, the Pirwapuquio (1300-650 B.C.) and the first phases, the Cochachongos

(650-1 B.C.), can be identified for the southern sector of the region; little is known for the northern sector, but what evidence we have suggests a continuing, relatively unchanged settlement-subsistence system.

The preference for hunting and herding over argricultural pursuits until the Wari conquest has produced settlement patterns consisting of non-permanent, perishable dwellings, easily transportable, and with seasonal occupation only of dwelling sites. The typical base camp settlements are small villages, seasonally occupied, and situated near a spring, stream, or other dependable water resource to supply sufficient water for llama herds and suitable land for wet-season horticulture. The largest villages during the wet-season may have had a few score semi-subterranean or subterranean, pithouses, with population sizes generally no larger than 100 persons. Other seasons of the year saw dispersal into smaller herding groups.

A reasonable amount of exchange, both on the idealogical and on the material level, took place. Ceramic design concepts were borrowed and actual vessels exchanged between the selva, the coast, and other highland localities. Material goods, such as Ecuadorian spondylus shell, coatal seashell pendants, whale vertebrae, were obtained from the coast and polished stone points from the northern highlands. Foodstuffs, such as coca and aji, were obtained from the selva, dried fish and corn from the coast, and potatoes and canihua from farmers.

Part of these goods were obtained by direct exchange of pastoral products, such as wool, meat, fat, etc., part no doubt, from their position as middlemen and in payment as caravan drivers, for loading their llamas with the respective trade goods and transporting them from zone to zone, so that by the time of the Spanish conquest caravan trains of 1,000 to 2,000 animals were common, and often undertook trading ventures of up to six months duration. The copper traffic was evidently relatively important; copper was mined near Jauja, and goods from the excavated site of Ataura suggest trade with both the central coast and the ceja de montana to the north. Copper so traded must have fed into the Chavin Interaction Sphere; with the collapse of Chavin influence on the coast at about 650 B.C., this copper trade also seems to disappear. By the end of this period, new ties were established with the Paracas Interaction Sphere on the south coast, and the copper trade was revived, this time flowing to the south coast.

By about 700 B.C. two major population clusters flourished in the valley--one in the now drained Lake Cochachongos quite near the previous center at the spring of Pirwapuquio and a second new location overlooking the Rio Cunas near the present-day town of Chupaca. Population densities had reached such a level that there was a fissioning into two independent polities, each with its own seasonally utilized administrative and ceremonial center. As before, subsistence was based primarily on llama and alpaca pastoralism, supplemented by hunting of deer, guanaco, and other animals, and the

gathering of wild plants. Additionally, some cultigens were planted along the margins of the lakes, stream flood plains, and canyon bottoms during the wet-season; the dry-season was spent primarily herding animals on the higher puna.

## The Ayacucho-Huanta Region

Three ceramic styles date to this period; Kichkapata (900-700 B.C.) formerly known as Wichqana, Chupas (700-500 B.C.), and the early part of the Rancha (500-300 B.C.) formerly known as Chupas. The number of components shows a marked increase over the preceding period--roughly 50 to 80--but the settlement patterns and subsistence activities remained much the same. The climate, however, seems to have changed and once again conditions have become more humid. Although survey and excavation were extremely limited in the high elevation areas, one excavated component indicated that the seasonal herding-potato-growing pattern of subsistence continued.

The majority of the sites occur in six or seven clusters in the lower parts of the valley. Four clusters appear to be organized around ceremonial complexes with plaza areas and/or pyramids with distinctive architectural features, including walls with large upright slabs separated from each other by horizontal slab-edge masonry. Another site cluster has a ceremonial center and a large rectangular structure with relatively little debris around it; the latter may have been an administrative center, storage complex, or both. A sixth site cluster lacks the ceremonial center but has one of the rectangular structures just mentioned. Around each of the site clusters, usually on terraces or hillslopes overlooking streams, are a series of small hamlets composed of from two to 20 round, slab-masonry house structures. Sixteen of the hamlets were associated with agricultural terracing along the contours of the adjacent hills or riverbanks; three included canals that lead to the terrace system. Outside of the clusters were numerous seasonal occupations--13 caves and 22 large open sites; irrigation features on five of the latter suggest they were farming areas periodically used by the sedentary villagers.

One interpretation of the evidence is that each site cluster represents a community. The hamlets were inhabited by kin aggregates who were ruled economically, socially, and politically by a well-defined elite group that resided in or around the ceremonial-administrative centers. Except for common religious practices and beliefs, these communities were relatively independent of each other.

## Interactions

The patterns of interaction described for the two preceding periods continued into this one. Foodstuffs were still being exchanged between the four regions and the tropical lowlands, and raw materials and ideas about pottery-making, water control systems, architecture, and community organization were still spreading at

different rates and with different intensities throughout the Central Peruvian Interaction Sphere. Furthermore, at least three of the regions--Ancon-Chilca, Huancayo-Junin, and Ayacucho-Huanta--have established independent ties with other areas, while simultaneously maintaining minimal ties among themselves. Not only were the pre-existing sets of networks maintained and in some cases expanded, but an entire new set of relationships were begun. The Ancon-Chilca region was integrated into the economic network of the Chavin. Both the Ayacucho-Huanta and the Huancayo-Junin areas were extending their economic networks in other directions, principally for the exploitation of new economic resources, such as copper, not widely utilized before, and in the establishment of new economic ties with groups on the ceja de montana, which at least in the case of the Huancayo-Jauja Region had not been previously very heavily utilized.

## Period 10: 450 B.C. - A.D. 300

Several new, interrelated patterns appear in the archaeological record during the last half of the first millenium B.C. One pattern consists of four elements that occur at different times in different places along the coast. It consists of (1) exchange networks that apparently incorporated the populations of several adjacent river valleys, (2) fortified hilltop settlements in many regions, (3) burials containing individuals with no heads or with their own heads as well as those of other individuals tied around their waists, and (4) occasional burials of individuals with massive depressed skull fractures or projectile points imbedded in vital parts of their bodies. This pattern is usually interpreted as one involving raiding, conquest, or some combination of both. It may well have been precipitated by population pressure on the food resources that were immediately available to particular groups.

In the Central Peruvian Interaction Sphere, this pattern is apparently closely associated with the spread of influence from at least two different regions on the south coast of Peru--one centered at Cahuachi in the Nasca Valley and the other centered in the Canete-Chincha-Paracas Region. Pottery with resin-painted designs and/or representations of Paracas mythical beings has been found as far south as the Acari Valley on the south coast and in the highlands in the south--the Tiahuanaco I style--to the Huancayo-Junin Region in the north. The idea of resin-painted decoration is most apparent in the Huancayo-Junin and Ayacucho-Huanta Regions in the Mantaro Valley, while the mythical representations of the Paracas style are most abundant in the Pucara and Tiahuanaco Regions to the south, where the pottery is decorated with pre-fired painted and incised designs. Ceramics in the Ancon-Chilca Region, from about 250 B.C. to about A.D. 150, share very specific features with the pottery of the Topara Tradition rather than that of the Paracas-Nasca Tradition. In other words, the potters of the Mantaro Valley were being more heavily influenced by events occurring in the Canete-Chincha-Paracas Region than in the Nasca Valley. This picture is even further complicated by the fact that ceramic styles found at middle elevations on the west

slopes of the Andes in central Peru share very specific design features with styles found in the same topographical contexts to the north--e.g., the Lumbra style of the Chancay Valley and the Huaraz White-on Red style of the Callejon de Huaylas and Chavin de Huantar.

## The Ancon-Chilca Region

This is the period when Ventanilla (ca. 250-50 B.C.) and Miramar (50 B.C.-ca. A.D. 250) pottery was manufactured and used on the central coast. For descriptive purposes, it is convenient to divide the period into early (250-50 B.C.) and late (50 B.C.-A.D. 250) parts.

The old pattern of coastal fishing villages and inland farming settlements persisted; however, the inland sites--both at lower and middle elevations--were fortified hilltop settlements located adjacent to arable land. Fishing villages have been found at Ventanilla and in the lower part of the Lurin Valley; the size of the Ventanilla population was significantly smaller than it had been earlier, presumably because the ancient bay uplifted about 250 B.C., thereby destroying the richest Mesodesma shellfish bed in the northern sector of the region and forcing the inhabitants around the old bay to rely increasingly on the less desirable intertidal shellfish found on the rocky points north and south of the bay. Shortly after 50 B.C., the entire Ventanilla area was abandoned and apparently not reoccupied until the nineteenth centry. Fortified hilltop settlements dating to the early part of the period were located in the lower Chillon Valley, the middle Rimac Valley, and in the lower and middle Lurin Valley. The largest hilltop settlements are in the lower parts of the valleys, suggesting a continuation of the old pattern where most of the population is engaged in agricultural activities in the low valley. Furthermore, slight stylistic differences between the Ancon-Chillon sector and the middle Rimac-Lurin sector may imply that the two areas were autonomous.

Miramar pottery occurs throughout the region at low elevations, and closely related styles have been found at middle elevation sites in both the Lurin and Rimac Valleys. There was a series of sequentially occupied small fishing villages at Ancon and Santa Roas which were associated with drying terraces, a small public structure, and perhaps a hilltop fort. The largest settlements were located on the valley floors in the lower parts of the Chillon, Rimac, and Lurin Valleys. The Chillon settlement was composed of two large house mounds, or apartment complexes, located about a mile and a half from a small pyramid,while the settlements in the Rimac and Lurin Valleys consisted of large numbers of small, dispersed house mounds. Settlements in the middle parts of the Lurin and Rimac Valleys, where arable land is at a premium even today, were situated on hillslopes overlooking the ocean and the valley floor. It consisted of a small pyramid made of conical adobes and scattered patches of habitation refuse.

The distribution of Miramar pottery changed with the passage of time. The earliest phase (50 B.C.-A.D. 25) has been found as far

north as Rio Seco; the second phase (A.D. 25-100) occurs only as far north as Ancon, while the last two phases have been found as far south as the Mala Valley. The wide distribution of Miramar pottery implies that the populations of the lower parts of several adjacent valleys participated in the same exchange network. The relative paucity of Miramar pottery in contemporary settlements located in the middle and upper parts of these valleys may indicate weakened ties between the coastal and upvalley groups.

The Huarochiri Region

There were two types of settlements in the Huarochiri Basin during this period. One consisted of fortified hilltop settlements with relatively large numbers of domestic structures. The other consisted of terraces on slopes overlooking tributaries of the Mala River; the terrace settlements contain relatively few domestic structures. Although there is nò direct evidence for subsistence activities in the Huarochiri Basis itself, the presence of terrace systems may indicate that agricultural production was becoming more important than it had been earlier.

The Huancayo-Junin Region

Cultural manifestations dating to this period are characterized by the later phase of the Cochachongo ceramic style (A.D. 1-250), by the Uchupas style (A.D. 1-250), and likely by the first phase of the Usupuquio ceramic style (A.D. 250-500) in the Jauja-Huancayo Valley. Ceramic style further north nearer to Lake Junin differ somewhat but share many of the same general traits. Painted ceramics from the San Blas Salt Mine date to this period.

The Cochachongos materials share many specific design features with the Ocucaje style of the south coast, while the Uchupas materials share many shape features with the Miramar style of the Ancon-Chilca Region. San Blas trade wares are found in Uchupas and Cochachongos sites in the Jauja-Huancayo basin of the Upper Mantaro, and these Upper Mantaro styles are also found in the Lake Junin sites. Furthermore, there were also striking similarities between the ceramic styles of the Huancayo-Junin, Huancavelica, and Ayacucho-Huanta Regions of the Mantaro Valley during this period suggesting increased contacts and exchange along the length of the Mantaro drainage.

Two main population clusters continued to be located near Lake Cochachongos and overlooked the Cunas River during the later phases of the Cochachongos pottery style. However, the appearance of Uchupas pottery styles about the beginning of the Christian era also marks changes in the political organization of the Jauja-Huancayo Valley and in the location of wet-season settlements. Settlements were moved from the valley floor to relatively isolated, easily defended hilltops and hillslopes overlooking suitable pasturage, arable lands, and sources of water. Such preference of relatively inaccessible,

easily defensible settlement location continued on into the succeeding Usupuquio phases. While there had been but two major population clusters in the late Cochachongos phases at the beginning of this period, in the fifth century B.C., by the end of this period, or by the beginning of the third century A.D., four major population clusters were in evidence--one in the foothills above the confluence of the Rio Chanchas with the Rio Mantaro, one in the hills above the Rio Cunas as it enters the basin, one in the middle of the valley, in the hills above the present towns of Cajas and San Geronimo, and a fourth center at the upper end of the valley in the hills above the Rio Seco and the Rio Alayo. Though it is not clear early in the period, by the end all four of these population clusters are composed of smaller hilltop sites occupied seasonally for at most a few decades, and centered around a lower hillflank or valley bottom site, which is usually typified by the occurrence of a number of figurines and which represents the ceremonial and administrative core of the cluster.

The early portion of Period 10 is characterized by a quickening economic tempo in the Jauja-Huancayo basin of the Mantaro. Not only is there a greater range in the quantity and kinds of goods entering into the trade network, but the network itself has been extended into regions previously outside the Jauja-Huancayo Interaciton Sphere. The end of the period is marked by a decrease in external exchange and a return to isolationism, so that by the third century A.D. there is little if any evidence of external contact.

Period 10 marks one of the few epochs when the Jauja-Huancayo basin participated in a meaningful way in shaping the general direction of Peruvian culture history. The wide-ranging llama trading caravans, emanating out of the puna from Lake Junin to Lake Titicaca, did much to integrate the sierra regions with the coastal regions, so that the sierra states of Huari, Tiwanaku, and Cuzco dominate much of later Peruvian prehistory.

In addition, metallurgical technology was almost certainly diffused to the south coast at this time by way of mining centers in both Junin-Huancayo Region and the Huancavelica Region.

Llama and alpaca herding with secondary guanaco and deer hunting and valley-bottom horticulture continued to be the basis of subsistence. Economic dependence upon inter-regional trade to produce additional access to agricultural products must have been well-developed by this time; in times following the Huari state, it became a major factor in subsistence of the few remaining pastoralists. Sites near Lake Junin, though less thoroughly recorded, indicate the continued existence of a seasonal transhumance pattern in that area as well.

## The Ayacucho-Huanta Region

Four ceramic styles date to this period: the later part of the Rancha style (450-300 B.C.), the Caja style (ca. 300-100 B.C.) which has been referred to earlier as the Huarpa I type, Huarpa (ca. 100

B.C.-A.D. 100), and Cruz Pata (ca. A.D. 100-300) which has been referred to as the Huarpa II type. In terms of site numbers (126) this period appears to be an apogee in the region. The seasonal herding and potato growing pattern continued at high elevations and at lower elevations, judging by excavations in cave deposits, there was intensive corn, bean, squash, and perhaps quinoa irrigation agriculture in addition to guinea pig and llama raising.

It is difficult to discern settlement clusters because sites with black-on-white pottery are located throughout the valley. However, two new types of large settlements suggest that there were seven or eight communities or political entities in the valley. One type is represented by three sites, each of which has a large compound-like area with large round and/or rectangular structures surrounded by a host of small roundhouses; these are often located near canals like the first one, except that there are one or more pyramids, or ceremonial structures in the central compound. These settlement types are classified as administrative towns and ceremonial-administrative towns, repectively. Another cluster of sites in the southeast portion of the valley is slightly different from the two types mentioned above. It consists of two sites on adjacent hills, both of which are surrounded by roundhouses. One hill has a large rectangular structure on it and the other, a pyramid. There may also have been an eighth community which was later destoyed by the construction of the imperial capital at Huari, since black-on-white sherds are abundant along the southeast edge of the site.

Five of the large administrative centers have smaller administrative hamlets (11) associated with them; three of the administrative hamlets are associated with small hamlets that have pyramids. Clustered around the hamlets were small settlements with two to ten roundhouses in them; 16 have irrigation features, as do 70 open sites without architectural features that also date to this period.

There appears to have been seven or eight political entities in the valley with their capitals in the large administrative towns which were usually located along rivers, but occasionally in easily defended places. Below these were the religious and small administrative villages. Elaborate irrigation features extended outward from these to hamlets and farms. Perhaps paralleling this site stratification were chains of power in both the religious and secular realms. The different sizes of the communities, the different kinds of structures in the sites, and the presence of tombs and cemeteries suggest that a hierarchical class system probably paralleled the political chains of command. One gets the impression of a series of small, rigidly controlled political entities with well-developed irrigation bases competing with each other throughout the valley. However, they seem to have had only limited political relations outside of the valley, except in the direction of Huancavelica, which lies directly to the east in the Mantaro Valley.

Interactions

Ceramic styles provide the best evidence for exchange patterns during this period. Between about 450 and 50 B.C., the Huancayo-Junin and Ayacucho-Huanta Regions participated in an extensive exchange network that was apparently orchestrated in large part by the inhabitants of the Nasca Valley on the south coast, who were also in direct contact with the populations of the Lake Titicaca Basin. The populations of the Ancon-Chilca and Huarochiri Regions participated only peripherially, if at all, in this exchange network and maintained only minimal ties with the two Mantaro Valley regions. By about 50 B.C., the inhabitants of the Canete-Chincha-Paracas Region on the south-central coast dominated another exchange network that had independent ties with the two Mantaro Valley regions and the Anon-Chilca Region on the central coast. Relationships between the central coastal and the two Mantaro Valley regions may have been more intense and direct than they had been earlier in the period. Data from the Huarochiri Region are inconclusive at the present time; however, they suggest that the inhabitants of the upper west slopes of the Andes did not participate actively in the Nasca or Canete-Chincha-Paracas exchange networks, but rather in one that stretched along the mountains at relatively high elevations from the Callejon do Huaylas to at least Huarochiri.

## Period 11: A.D. 300 - 650

The outstanding characteristic of this period was the formation of relatively large, multi-valley exchange networks, or states, in the coastal regions of Peru. These included one on the north coast, presumably centered in the Moche Valley, another on the central coast that was probably centered in the lower parts of the Chillon and Rimac Valleys, and a third on the south coast that was centered primarily in the Nasca Valley. States were apparently also forming in the highlands at this time in Cajamarca, Huamachuco, and the Ayacucho-Huanta Region. About A.D. 550, a ceremonial art style, reviving certain elements of the Chavin style, was introduced into both the Ayacucho-Huanta Region and Tiahuanaco at the southern end of Lake Titicaca. Elements of this style, and presumably of the belief system associated with it, spread rapidly throughout the central Andes, as a state centered at the city of Huari in the Ayacucho-Huanta Region expanded rapidly to include much of central and southern Peru between A.D. 600 and 650.

A complex set of events occurred between A.D. 450 and 550 that may have had a considerable impact on what happened during the next two centuries. First, the total populations of some coastal regions seem to have reached maxima about this time. Second, the interval of slightly increased precipitation continued in some highland regions, which resulted in slightly increased runoffs in the rivers of some coastal valleys. Water-control systems were expanded considerably in several coastal velleys at this time, presumably to take advantage of the increased runoff to bring formerly marginal lands under

cultivation. Third, precipitation apparently returned to normal or even subnormal levels around A.D. 500. As the amount of available water diminished, the kinds of crops grown on the marginal lands would have changed to ones that were particularly well adapted to dry conditions. Eventually, the marginal farmlands would have been abandoned altogether, when there was no longer enough water for even these dry-adapted crops. The effects of this would have been felt most strongly in those areas where large amounts of marginal land can be brought under cultivation with only a slight increase in rainfall. Presumably, there was increasing population pressure on the existing food resources in these areas during the sixth and seventh centuries.

## The Ancon-Chilca Region

Lima (A.D. 250-600) and Nieveria (A.D. 600-650) ceramics were manufactured on the central coast during this period. This was also the time when the population of the Ancon-Chilca Region reached a maximum--one that corresponds closely with the size of the total population on the eve of the Spanish conquest, at least in terms of the total area of settlements. Furthermore, there were relatively systematic differences in settlement patterns between the Chillon and Rimac Valleys, on the one hand, and the Lurin Valley, on the other. These differences are most pronounced in the lower parts of the valleys, after the rivers emerge from the canyons and their gradients become less steep.

In the lower part of the Chillon Valley, there was a series of sequentially occupied towns associated with one or more pyramids or platform mounds. The earliest settlement, Cerro Culebra (ca. A.D. 300-400), consisted of a single platform mound and numerous residential structures made from both adobe bricks and canes, located in non-arable lands along the edge of the valley. The later settlements in the lower Chillon Valley, Cerro Campana or Copacabana (A.D. 400-450), and La Uva (A.D. 450-500), consisted of pyramid and platform mound complexes associated with habitation refuse; these were located along the edges of the valley in places where irrigation agriculture was easily practiced. In fact, irrigation features, still used at the present time, are in close proximity to both sites. Contemporary with these large settlements are small hamlets dispersed throughout the valley on hillslopes overlooking arable land. The largest settlement in the lower Rimac Valley was located on the valley floor at Maranga; This settlement and the pyramids associated with it began at least as early as A.D. 300 and was not abandoned until at least A.D. 600. Another lower Rimac Valley pyramid was located at the Huaca Juliana (ca. A.D. 500-600). Major irrigation canals, still in use today, end at both the Maranga and Huaca Juliana settlements; it is likely that the water-control systems and the pyramids were built about the same time. The other large settlement in the lower Rimac Valley was Cajamarquilla, which was initially occupied at least as early as A.D. 450.

Settlements in the Lurin Valley were located on hillslopes overlooking arable land on the valley floor and were not associated with the construction of pyramids until about A.D. 500 at one site--Pachacamac. Four of the low and middle valley settlements are directly associated with water-control systems that had to have been built or modified at the same time the settlements were established. This indicates that the present water-control system of the Lurin Valley has not been substantially modified during the last 15,000 years. Sites containing late Lima style pottery (ca. A.D. 300-500) occur well above the 1,500 meter contour suggesting that the coastal population was continually extending its influence up-valley during this period. There are also contemporary, virtually identical sites in the middle parts of the Rimac and Chillon Valleys.

In addition to the valley-oriented sites, there were also fishing villages in the Ancon area and a number of winter campsites located in the lomas areas. The latter apparently represent the increased importance of llama herding in the region.

A complex set of changes in settlement patterns occurred during this period. About A.D. 500 the pyramid complexes of the Chillon Valley and the settlements associated with them were abandoned; these were replaced by small hamlets located on hillslopes overlooking the valley floor. About the same time that the pyramid complexes and their settlements were declining in importance throughout the Chillon-Rimac sector, a large nucleated settlement was developing at Cajamarquilla and two pyramids were under construction at Pachacamac in the Lurin Valley, a site which was formerly only a farming and fishing settlement. These events suggest (1) a shift in population from the entire lower Chillon-Rimac area towards Cajamarquilla and small farming hamlets scattered throughout the valleys, (2) the consequent abandonment of the earlier pyramid complexes in the area which continued to be used during the time Nieveria pottery was manufactured as burial grounds, and (3) the increased importance of Pachacamac with respect to the "ceremonial" activities that were performed in these pyramid complexes.

## The Huarochiri Region

The settlement patterns, and presumably the subsistence activities, of the preceding period persisted with little apparent change. The fortified hilltop settlements continued to be used, and the hamlets associated with terraces were occupied as well. Coastal populations apparently had agricultural fields in the lower elevations of the Huarochiri Region. This suggests that the boundary between the Ancon-Chilca and Huarochiri Regions were not stable through time.

## The Huancayo-Junin Region

The ceramic styles of Usupuquio (A.D. 250-500), Huacrapuquio (A.D. 500-600), and the first phase of Calpish (A.D. 600-800) were manufactured during this period. While the Usupuquio style is

localized and shares few, if any, features with contemporary styles elsewhere in the Central Peruvian Interaction Sphere, the Huacrapuquio style shares very specific features with the contemporary styles of the Ayacucho-Huanta Region, and the first phase of the Calpish style is in large part derived from Ayacucho-Huanta Region styles. Thus, the Huancayo-Junin Region was relatively isolated between A.D. 250-500, but following A.D. 500 there was continually increasing contact with the Ayacucho-Huanta Region, culminating in the incorporation of the region into the Huari state between A.D. 600-650.

Virtually all of the Usupuquio phase sites were situated on easily defended hillslopes and hilltops overlooking the valley floor. Shortly after the third century A.D., a fifth major population cluster or center emerged, so that in addition to the previous four clusters--one in the upper valley in the hills above the Rios Alayo and Seco, one in the middle valley in the hills above modern-day Cajas and San Geronimo, and two in the lower valley, one above the Rio Cunas and the other above the Rio Chanchas--there was a new mid-valley cluster in the hills above Mito and Orcotuna. Each of these different ethnic or political clusters was associated with a larger, lower cluster core site which contained figurines and other indications of being important ceremonial and administrative centers for the respective cluster.

Huacrapuquio settlements mark a period of renewed interaction with surrounding regions, particularly with the Ayacucho-Huanta Region. Settlements are once again found on the lower valley slopes or on the valley floor itself. During the Usupuquio phases, the center of population density was in the mid-valley, with large numbers of sites in the neighborhood of Mito and Orcotuna on the West bank of the Mantaro. During the Huacrapuquio phases there was a definite population shift down-valley, to the lower end, which was more proximal to the increasingly important Ayacucho-Huanta state. There are increasingly fewer sites in the upper valley, the center between the Rio Alayo and Rio Seco tributaries is abandoned, and by the end of the Huacrapuquio phase the upper end of the valley appears to be essentially unoccupied. In mid-valley, there is also a southward shift of population. The Orcotuna-Mito center is abandoned by the end of the Huacrapuquio phases, and the Caja-San Geronimo center, though still functioning, now only has a few sites associated. The greatest number of sites cluster in the southern end of the valley, particularly along the Huancayo-Huamanmarca-Huacrapuquio-Chongos Bajo axis, the area where later the branch oracle of Wariwilka is established. Sites also increase on the southern flanks of the Rio Cunas, though not to the same degree; this is the area where the later temple site of Calpish is situated.

The late Huacrapuquio phases and the first Calpish phase mark a period of extensive social disorganization and concomitant reorganization in the Jauja-Huancayo sector of the Huancayo-Junin Region. This crucial epoch of no more than a century's duration, marks the shift from primary llama and alpaca pastoralism, with secondary hunting and horticulture to an economic base of primary agriculture with

secondary herding. Although hunting activities continue to provide significant quantities of food through the earlier Usupuquio phases, hunting declines during the Huacrapuquio epoch, and by A.D. 650 has ceased to be an important economic activity; artifacts associated with hunting are common until about the fourth century A.D. but have disappeared completely by the seventh century A.D. The first permanent agricultural settlements appear to be developing during the last phase of Huacrapuquio occupation; permanent year-round settlements are common by A.D. 600, with towns appearing set out on grid patterns. Social stratification and hierarchical ranking is evident along with extensive craft or guild specialization. Two important temple complexes are constructed between A.D. 600-650--one at Calpish, which apparently was more closely associated with the Huari state, as it disappears with the collapse of the Huari state a few centuries later, and the second at Wariwilka, where a branch oracle was established which survived until A.D. 1534 when it was sacked and destroyed by Manco Inca.

The Ayacucho-Huanta Region

The Pongora style (A.D. 300-550), referred to in the past as Huarpa or Huarpa III, and the Conchapata style (A.D. 550-650), which has been called Wari I and includes both Conchapata and Chakipampa pottery, were made during this period. There was a significant reduction in the number of sites in the region (41), even though the total population may have increased. There were nine large towns, superficially like those of the preceding period, but with rectangular rooms or houses arranged around a square courtyard and then against some sort of compound wall or delimiting element. The number of compounds varies from one town to the next, ranging from one to five or six. In some instances, the compounds connect with each other. The rectangular rooms or houses with well-made block masonry vary considerably in size, and it is often difficult to tell where the center of the whole town was located. One of the towns represented the initial building stage at the site of Huari. A tenth town differs from the others in that it has a large pyramidal structure in the central compound.

Other types of settlements also occurred but were not concentrated around the central towns. They consisted of four small administrative compounds, one village with a pyramid, 13 hamblets with rectangular houses, nine open sites including four on the puna which probably represent the persistence of old life ways, and four cave occupations. Although elaborate irrigation features still occurred in the valley, they do not seem to have been as elaborate as they were earlier, nor do they seem to link series of settlements together. Elaborate tombs of varying size and splendor have been reported for this period; however, no unlooted ones were found.

It appears that the valley has been welded into a single political unit with the large towns being the administrative centers of this

entity. The population seems to have been concentrated in these centers, although some individuals may have carried out subsistence activities away from them. Artifactual materials suggest, perhaps more than ever before, that many individuals were engaged in non-subsistence activities--such as craft specialities, trade and commerce, military, and bureaucratic ones. It is also possible that the chain of political control and the hierarchy of social classes were identical with each other.

Interactions

Ceramics again provide information about the kinds of interactions that occurred during this period. The inhabitants of the Ayacucho-Huanta Region were in contact with those of the Nasca-Ica Region on the south coast between A.D. 400 and 500 and borrowed a number of design elements that were incorporated into the Pongora style at that time. These contacts ceased during the next century as the Ayacucho-Huanta population established close relationships with the inhabitants of the upper part of the Mantaro Valley, including the Huancayo-Junin Region. From A.D. 500 onward, there were only slight differences in the ceramic styles of the Mantaro, which suggests that contacts were numerous and inter-relationships between the various parts of the valley were close at this time. About A.D. 600, the Ayacucho-Huanta population re-established close relationships with the south coast and extended their influence along the coast from Acari in the south to Chancay and the Callejon de Huaylas in the north.

The spread of Ayacucho-Huanta influence throughout much of central Peru after A.D. 600, as well as the patterns of archaeological associations in these regions, strongly suggest conquest by the military forces of a state with its capital at Huari. From the perspective of community self-sufficiency, this implies that the inhabitants of the Ayacucho-Huanta Region were no longer able to support themselves with locally available resources and that they were gaining access to these needed items by acquiring lands elsewhere in central Peru through military conquest, subjugation of foreign populations, and some form of tribute payments that were perhaps analogous to what the Incas did during the fifteenth century.

## Period 12: A.D. 650 - 850

The Huari Empire reached it greatest extent during the last half of the period. It extended in the highlands from Cajamarca in the north to Cacha, near Sicuani, and Chuquibamba in the south. On the coast, it reached from the Chicama Valley in the north to the Ocona Valley in the south. Apparently in the first half of the period, large storage complexes were built at Wiraqocha Pampa near Huamachuco and at Pikillaqta in the lower Cuzco Valley. These suggest that the Huari rulers, like the Incas, were concerned with the collection and redistribution of goods in provincial areas.

Huari influcence was not uniform throughout central Peru. Pottery actually manufactured in the Ayacucho-Huanta Region or local, provincial limitations of it are fairly common in some areas of the empire and are virtually absent in others. In the Ancon-Chilca Region, for example, these prestigious ceramic styles are most abundant in tombs at the important settlements in the area and occur only rarely at the small hamlets. Furthermore, there were three areas that had some sort of special status in the empire, judging by the distribution of their pottery styles. One of these was Cajamarca and the other was the area where the Geometric on Light style was manufactured--perhaps Huamachuco. The abundance of Cajamarca III and Geometric on Light pottery at Huari itself suggests that there may have been foreign colonies at the capital. The third area with special status was the Ancon-Chilca Region. Pachacamac pottery has been found along the coast from the Chicama Valley in the north to the Nasca Valley in the south and inland to the Huancayo-Junin Region. It appears that the central coast peoples were subordinate to those of Huari, but nevertheless established a large semi-independent sphere of influence of their own; they probably exercised this influence through a series of branch oracles that were related to the one established at Pachacamac about the beginning of this period.

The Huari Empire collapsed suddenly at the end of this period, and the imperial capital was virtually abandoned. The reasons for the collapse of the empire are undoubtedly complex and involve not only events that were taking place in the capital but also conditions that were emerging in the provincial areas. The Ayacucho-Huanta Region was subject to heavy dessication which suggests that the population was no longer able to feed itself with locally produced goods and that its members had to rely increasingly on foodstuffs produced in other regions. These demands may have been relatively easily met as long as the size of the state was increasing and new ethnic groups were incorporated into it. The additional goods and services required by the state could be drawn from the new incorporated areas of the empire. However, once the state stopped expanding geographically, the additional demands had to be met by groups that were already supplying Huari. This must have placed a continually increasing burden on these groups and must have been a source of growing dissatisfaction as they saw more of their produce and labor drawn off by the state. Furthermore, there were few, if any, technological innovations during the period that significantly increased the productive capacities of these groups over the growing demands of the state, combined with their inability to increase production, may well have set the stage for revolutionary changes in the structure of the Huari Empire.

## The Ancon-Chilca Region

Pachacamac A-B pottery was manufactured on the central coast during this period. The most elaborate specimens of this style have come from tombs that were excavated at Ancon, Cajamarquilla, Vista

Alegre, and Pachacamac--four of the five known sties that date to this time. Tombs containing Pachacamac B pottery are numerically more abundant than those with Pachacamac A pieces. Since both phases have approximately the same duration, this fact may represent a sampling bias in the data or that mortality rates were greater during the last half of the period. Habitation sites are scarce throughout the region, either because they are deeply buried under late occupations or because they simply do not exist in the same numbers they did earlier and later.

The fishing village at Ancon continued to be occupied, but its location on the Pampa de Ancon had shifted somewhat from the end of the preceding period. Cajarmarquilla, a large settlement in the Rimca Valley, was occupied continuously; however, the cemetery at the site that had been in use for nearly three centuries was abandoned. It is not clear whether the site was partially or completely abandoned at this time because of the large amount of later construction there. Vista Alegre, another site in the lower part of the Rimac Valley, was apparently abandoned by the time Pachacamac B pottery was being manufactured. A third site in the Rimac Valley was a fortified settlement located on an easily defended hillslope near the junction of the Rimac and Santa Eulalia Rivers; it lacks the elaborately decorated Pachacamac style specimens found at other sites on the central coast.

An important temple, dedicated to an oracle, was built as an addition to one of the pyramids constructed at Pachacamac during the preceding period. Pottery, presumably emanating from the shrine and the settlement associated with it, has been found at various localities on the north and south coasts of Peru and in the central highlands. Judging by the behavior of this oracle after the Inca conquest and the patterns of archaeological evidence at that time, the oracle at Pachacamac appears to have established branch oracles in other regions, once these areas were incorporated into the Huari Empire.

## The Huarochiri Region

Five sites in the Huarochiri Basin seem to date to this period. They were systematically located on ridges overlooking the valley floor. Three of the sites contain oval, stone burial crypts associated with badly damaged architectural complexes, at least one of which is composed of rectangular stone houses. A fourth site contains only domestic architecture, and the fifth one contains only oval crypts. There is no evidence concerning subsistence activities in the Huarochiri Region during this period. However, they were presumably not very different from what they had been earlier--farming on hillslopes and terraces during the wet season and herding in the *puna* during the dry season. It is possible that there was some degree of specialization in these activities, in the sense that one individual did not participate equally in both of them.

## The Huancayo-Junin Region

Pottery of the Calpish style (A.D. 600-800/850) was manufactured in the Jauja-Huancayo basin during this period. At the temple complex at Wariwilka and the temple complex of Calpish, trade wares from the Pachacamac style from the Central Coast, the Geometric-on-Light and the Cajamarca Cursive styles from the North Highlands, and the Vinaque and other styles from the Ayacucho-Huanta Region are found in high prestige burials and in the associated temple refuse. Toward the end of the Calpish period, a third temple complex is constructed in the foothills above Lake Nahuinpuquio. In contrast to the other two temples, no high prestige trade wares from other administrative areas of the Huari state are found, and it is likely that this temple was constructed during a period of increasing demographic stress, when the Huari state had begun to falter and collapse.

Occupation in this period in the Jauja-Huancayo basin is centered almost exlusively at the southern end of the valley. Most of the sites are clustered around the two major temple complexes of Calpish and Wariwilka, though at the end there is a shift from the area of Calpish to the newly constructed temple complex of Nahuinpuquio. The larger occupation sites consisted of stone structures arranged at regular intervals in a grid pattern; the smaller hamlets usually contained a few stone structures as well as a larger number of perishable buildings. The temple complexes were surrounded by enclosing walls, and were composed of rectangular buildings arranged around rectangular courtyards in general. At Calpish there were stone-faced circular structures, each of three or four tiers, similar to the four-tiered circular structure found in the Sullu Cruz section of Huari, and to a similar tiered structure at the site of Cangallo in the Rio Pampas.

Hoes, hoe fragments, and other agricultural-related tools now form the impoverished lithic industry. Artifacts associated with hunting, carcass preparation, etc., which were formerly ubiquitous, have all but disappeared. Storage colca, which form the economic backbone of the valley in later periods, make their first appearance during the Calpish occupation. Such storage complexes seem to be outgrowths of similar complexes found in the Huari state at this time, such as at Capilla Pata at Huari, Pikillaqta near Cuzco, Viracocha Pampa near Huamachuco, Pampa de las Llama in Casma, or Wisajirca near La Union in Huanuco.

## The Ayacucho-Huanta Region

Huari not only developed into a true city during this period but also became the capital of an empire--perhaps the first true empire in the Andean area. Unfortunately, this huge, well-preserved site has never been adequately investigated, but recent aerial photographs, limited mapping, and excavations into one compound permit some tentative interpretations. Although there is a large area in the southern part of the site with individual structures surrounded by a peripheral

zone with many sherds and limited evidence of architecture, the major part of the site is composed of 70 to 80 rectangular or square compounds, usually with a large D-shaped or circular structure located in their centers. Clearing excavations in a portion of one of the medium-sized compounds, which range from 100 to more than 400 meters on a side, revealed that it was filled with tightly-nested rectangular rooms and workshop areas. The residents of one portion of the excavated compound were engaged in manufacturing mold-made pottery. Superficial surveys in other compounds revealed that one was involved in manufacturing turquoise ornaments; a second contained large quantities of flint and obsidian flakes; a third contained many marine shells; and a fourth contained hundreds of finished projectile points and no chipping debris. These data have a number of implications. First, they suggest that the population of the city ranged from at least 50,000 to perhaps more than 100,000 residents. Second, they indicate that the compounds were not just ceremonial or even living areas but rather highly organized industrial districts. Third, they suggest that there was a considerable degree of economic specialization within the city. Fourth, they suggest that these compounds may have been involved in producing exports from imported raw materials so that the center of the empire maintained a favorable "balance of trade." Fifth, Huari had a large population, many of whom were full-time craft specialists, arranged in a rigid hierarchical class system, organized by an efficient political group that held power not only over the local situation but also over the military, economic, commercial, and social conditions of the empire.

Although the majority of the population in the valley probably lived in Huari itself, there were also seven administration towns with from one to six compounds and two small administrative centers with a single compound each. It is probably significant that only seven hamlets, six open camps, and four cave occupations were located in the valley at this time. These facts in conjunction with soil studies which show that sites of this period and the previous one overlie a dark forest soil horizon and that they, as well as the more recent sites, are associated with the alluvial soils of a weak desert soil horizon, suggest less intensive and successful subsistence activities. In other words, the potential for agricultural production was diminishing throughout this period.

## Interactions

Ceramics again provide useful information concerning the interactions that were taking place during this time span. The inhabitants of the Ayacucho-Huanta Region certainly played a major role, perhaps the most important one, in the affairs of the central Andes, since Huari influence is evident throughout most of the area. However, the oracle at Pachacamac also extended its sphere of influence to include much of the Peruvian coast and at least the Huancayo-Junin Region of the central highlands, where it may have shared some power with Huari and perhaps to a lesser extent, the inhabitants of the Cajamarca Region in the north highlands.

## Period 13: A.D. 850 - ca. 1425

After the collapse of the Huari Empire, the capital city was virtually abandoned, some coastal areas were apparently depopulated and suffered economic depressions, and within a few centuries, small regional states appeared in various parts of the old empire. If revolutions begin among the more prosperous and less oppressed groups, then the events that may have precipitated the collapse of Huari political control probably occurred first in the north, where the earliest successor states appear and where there is little evidence of either depopulation or economic depression during the last years of the empire. This pattern of small regional states with continually changing boundaries and varied political institutions continued until the fifteenth centry, when one of them--the Incas from the Cuzco Basin in the south highlands of Peru--began to expand its sphere of influence, which ultimately included all of the coastal and highland areas from northern Ecuador to central Chile and northwestern Argentina.

### The Ancon-Chilca Region

There was a single ceramic style in the region from about A.D. 850 to 1050 that has been referred to by various names: Late Ancon I, Middle Ancon II, Epigonal, and Three-Color Geometric. It is best known from gravelots excavated at Ancon and Pachacamac, although similar pieces have also been excavated in the Chancay Valley to the north. This pottery, which is tentatively being called the Chillon style, can be divided into at least three chronologically distinct phases on the basis of gravelot associations; the last phase probably dates between A.D. 1000 and 1050. The existence of this style probably reflects the continued importance of the oracle at Pachacamac after the collapse of Huari politcal control on the central coast.

Subsequently, the pottery styles of the northern and southern sectors of the region diverged from each other. The pottery of the sector lying north of the Chillon River shows close affinities with the Chancay Black-on-White style. A contemporary but very distinctive style is found south of the Chillon River in both the Rimac and Lurin Valleys. Both styles can be subdivided into a number of chronologically distinct phases. The differences in the ceramic assemblages found in the two sectors may relfect Cobo's statement that there were two nations inhabiting the central coast of Peru, each speaking its own language. One language was spoken from Carabayllo in the northern Chillon Valley to Chancay and the other from Carabayllo south to Pachacamac. The divergence between the pottery styles of the region after A.D. 1050 suggests that the influence of the Pachacamac oracle became more localized in the southern sector during the later part of this period.

Another document dating from A.D. 1550, which has only been partially published so far, indicates that an ethnic group centered

on the coastal plain in the lower part of the Chillon Valley controlled lands in the middle part of that valley at Quives, where coca was the principal crop. Archaeological sites yielding ceramics similar to those of the coastal plain have been found around Quives. Similar patterns of archaeological evidence have also been recorded in both the Rimca and Lurin Valleys. In general, nucleated settlements of varying sizes occurred throughout the entire region. Those on the coastal plain were located in places where agriculture could not be successfully practiced--along the edges of the valleys, on the slopes of isolated hills on the valley floors, or in areas where marine resources were abundant. Settlements at higher elevations in the river canyons were usually located on the lower slopes of hills overlooking the valley floor; several of the earlier ones were associated were fortified hilltop refuges. Ethnohistoric sources dealing with both the Ancon-Chilca and Huarochiri Regions provide evidence which account for the presence of fortified sites in the middle parts of the river valleys. There was a great deal of conflict over the control of lands in the middle parts of the river valleys, along the boundary between ethnic groups living in the Huarochiri Region and those living in the Ancon-Chilca Region. These conflicts apparently took the form of raids in which one group would drive the resident population of another group from their lands. At one moment, a coastal group might control a particular plot of land; later, a highland group might occupy the same landholding. Consequently, the boundary between the Ancon-Chilca and Huarochiri Regions is blurred for two reasons during the later part of this period. First, a coastal group might control a particular landholding around the 1,000 meter contour, and then a highland group would control it. Second, at any given moment, a coastal group might have lands at higher elevations in the middle parts of the river valleys than a highland group.

## The Huarochiri Region

Ten sites in the Huarochiri Basin date to this period. Three have rather small concentrated refuse deposits located in or adjacent to settlements occupied by various *comunidades indigenas* at the present time; these groups are all mentioned in a late sixteenth or early seventeenth century document and consider their "core lands" to be located in the immediate vicinity of these settlements. A fourth site is a large cemetery with oval burial crypts and associated plazas located near the core lands of another *comunidad indigena* in the area. The remainder of the sites consist of isolated houses located in agricultural fields or on terraces. Ethnohistorical documents again provide useful insights into the meaning and significance of these settlement patterns and how Huarochiri society as a whole functioned during the later part of this period.

The people of Huarochiri, or the Sons of Pariacaca as they called themselves, held lands from the coca and corn fields in the middle parts of the Rimac and Lurin Valleys to the *puna* overlooking them. They were grouped into a series of segmentary lineages. At the

highest and most inclusive level, they were the descendants of Pariacaca, and their relatives would found as far north as Canta and as far south as Yauyos. At less inclusive levels, they were descended from one of Pariacaca's sons or one of their offsprings, and both the number of their relatives and the territory they occupied were more restrictive. The segments were apparently ranked, judging by the fact that some lineages were referred to as the "little brothers" of more prestigious and wealthy units in the area.

The lineage segments were corporate landholding groups that attempted to establish and maintain self-sufficiency by controlling lands and their resources in different environmental settings on the west side of the Andes--corn and coca fields at low elevations, potato fields between the 3,000 and 3,500 meter contours, and grazing lands for llamas and alpacas in the puna grasslands. Judging by the contemporary situation in the area and by statements in historical documents, each lineage had core lands on which a large number of the members lived and worked; these core lands were usually located on the margins between two environmental zones where different resources were available. Smaller numbers of individuals belonging to the same lineage occupied lands in other environmental settings. Consequently, the landholding patterns of a given lineage resembled a chain of islands scattered throughout a sea of lands that they did not control. The core lands of the various lineages and the settlements inhabited by the majority of their members are probably represented by the sites with concentrated refuse deposits located near the modern settlements, while the isolated houses represent outlying lands controlled and inhabited by small numbers of individuals belonging to lineages that had core territories located elsewhere in the area.

It is also clear from the documentary evidence that lineages without extensive landholdings or control resources--wealth in their terms--often raided the members of other ethnic groups, particularly those from the coast, in order to gain access to additional lands and resources. Many of these conflicts seem to have occurred around the 1,000 meter contour, which may account for the existence of fortified hilltop sites with storage facilities in the middle valleys; several of the conflicts apparently involved control of coca fields or the theft of huacas, or sacred objects, that were ranked in some fashion. In any event, a lineage gaining new lands or new sacred objects was also gaining new wealth and new prestige. These disputes probably began as small-scale ones between individuals from different ethnic groups claiming rights of use to the same field; these disputes probably escalated quickly, according to one source, as the individuals turned first to other members of their lineages for support and then to other related lineages for additional aid.

There were at least two integrating mechanisms in Huarochiri society beside the reciprocal exchange of foodstuffs produced in different resource areas. One consisted of a "ceremonial round" that

began after the harvest season. The members of one lineage segment would travel to the puna to hunt deer and guanaco, which they would present to their kinsmen who lived around the 1,500 meter contour in the Rimac Valley; additional foodstuffs produced in that locality were then carried to another group of kinsmen who lived around the 800 meter contour in the Rimac Valley. Foodstuffs were again exchanged and goods were then carried into the middle part of the Lurin Valley. Another set of exchanges occurred there before the lineage members returned to their core lands in the upper part of the Lurin Valley. Four of these ceremonial rounds are mentioned in ethnohistoric sources, each involving a different group and a different route.

The second integrating mechanism involved the ceremonies performed around the principal huacas of the lineage. The members would gather where the huaca was located, and the appropriate ceremonies were performed. At least some of these involved the veneration of the dead. According to the ethnohistoric documents, a ceremony that took place in the Ricardo Palma sector of the middle Rimac Valley involved numbers of males coming together and dancing on the top of a platform mound dedicated to a local female deity who was very interested in observing their genitalia. In another ceremony that apparently occurred in the upper Lurin Valley mummy bodies were brought out of the tombs, placed in the middle of a circle, and surrounded by the living members of the group. The wealthy members sat on the inner edge of the circle because of their importance, while the poorer individuals sat on the outer fringes, participating only peripherally in the activities of the occasion. Everyone, including the mummy bundles, consumed food and maize beer at these festivities. Ceremonies such as this one may well have taken place at sites with oval burial crypts and plazas, like the one found in the Huarochiri Basin.

## The Huancayo-Junin Region

The Quinsahuanca (A.D. 800/850), Matapuquio (A.D. 1050-1250), and Arhuaturo (A.D. 1250 to ca. 1470) pottery styles were manufactured in the region during this period. The Quinsahuanca style involved a number of archaisms, which revive features that predate the Huari conquest of the area. These archaisms reflect deliberate symbolic attempts by the inhabitants of the region to imitate a past that they did not fully remember and to rid themselves of this visible reminder of Huari occupation. In terms of the ceramics, the closest relationships exist between this region and ones lying down the Mantaro Valley in the vicinity of Huancavelica and Ayacucho-Huanta. These similarities, however, reflect parallel developmental trends in the various regional art style rather than close contacts among the peoples. The settlement patterns in the Huancayo-Junin Region suggest a period of retrenchment and relative isolation, interrupted by raids and feuds.

Settlement patterns indicate similar retrenchment. There is a dramatic demographic shift from a valley population centered on the

hills in the narrower upper reaches of the basin. During the Quinsahuanca phases, the population in the valley is centered near Jauja, in the hills between Molinas and San Lorenzo on the East bank of the Mantaro, and in the hills above Muquiyauyo and Huancali on the west bank of the Mantaro. In addition there is an important secondary series of population clusters in the hills above the Rio Cunas. These clusters shift slightly up and down the valley during the succeeding centuries, moving apparently each time there was a major change in succession, or a major change in the balance of power between the ethnic groups. For example, the capital of the Hananhuanca group in the sixteenth century was first at Sapallanga, then at Sicaya, and later at Chupaca.

The small town-size settlements of no more than 2,000 individuals were constructed similarly throughout the 600-year period from the middle of the ninth century A.D. to the middle of the fifteenth century A.D. The typical town built on a low hilltop or knoll had a row of storage buildings circumscribing its lower flanks, clearly serving double duty both as storehouses and as defense redoubts. On the uphill side of this encircling row of storage colca were clustered the dwellings of the poor barrio, relatively small and irregularly clustered together. Dwellings nearer the center of the site were larger and were grouped around regularly-shaped courtyards with the center of the town itself dominated by a large ceremonial plaza and sometimes with an associated temple or administrative edifice.

During this period, elaborate storage complexes were developed as a cultural response to the extremely capricious variations in precipitation which previously had made pastoralism a more desirable ecological adaptation than agriculture. These storage complexes, with more than 120 buildings in a single row in some cases were used to store both foodstuffs and manufactured goods. Such storage complexes made the Jauja-Huancayo basin a major supply base for the later Inca state and also supplied the Spanish conquistadores with the necessary logistical support to conquer the Peruvian empire and with which to spend the next two decades squabbling over the spoils.

At the time of Inca conquest, the Huanca groups had control of a number of vertically situated environmental zones. Landholdings were exploited in several different biotopes where specific varied resources were available. Frequently, landholdings were separated from one another by lands belonging to other ethnic groups, giving some zones mosaic multi-ethnic configurations. Political integration of these spatially separated zones was very similar to that just described for the Huarochiri area.

The flat flood plain of the Jauja-Huancayo basin (ca. 3300 m.) was primarily utilized for agricultural products by this time, including various tubers such as potatoes, oca, ulluco, and mashua, and various grains such as quinoa, canihua, and maize. The herds of llamas and alpacas were pastured on the surrounding hillsides and

valley rim puna some 600 meters higher (ca. 4000 m.). Grazing areas a day or two away may have been shared with the Yauyos group or groups from Huarochiri. The Huanca had several lowland montana settlements, multi-ethnic in composition, for the production of coca, aji, yuca, gourds, and other selva products. In the Pacific coastal Chillon Valley, the Huanca also appear to have established mitmaqkuna or colonists in among the coastal inhabitants for the production of maize, cotton, and other regional products.

## The Ayacucho-Huanta Region

Huamanga or Huari III (A.D. 850-1200) and Argalla (A.D. 1200-1450) ceramics were manufactured in the region during this period. For descriptive purposes, it is convenient to divide the period into earlier and later parts defined by the duration of the two pottery styles.

During the early part of the period, the population of the region diminished considerably, and there was a major change in the settlement patterns. Pollen studies indicate that the present period desiccation began early in this period. These are probably related to significant changes in the social, economic, and political conditions that prevailed. Huari may have continued as an urban center during the first 50 years, but the evidence suggests that it was no longer an imperial capital. Later, it seems that city was inhabited by only a few stragglers, all of whom perhaps lived among the ruins in one of the old compounds where the remains of a small hamlet were found. Huamanga polychrome sherds also occur on most of the five former administrative towns in the region. Two of the towns located just east and west of Huari continued relatively unchanged throughout the period. However, the most common settlement type is the hamlet composed of small numbers of square structures situated in easily defended localities. Two of the hamlets have well-constructed fortification walls surrounding them as do a shrine and two small administrative towns with a single compound each. Nine open sites, one cave, and four of the five modern puna-herding hamlets also yielded Huamanga pottery.

Relatively little is known about the later part of the period, although ethnohistorical studies now being conducted should help to clarify the archaeological evidence. Four sites located on spurs or peaks around the 3,000 meter contour and surrounded by fortification walls are particularly characteristic of this time. They consist of closely-packed round and rectangular structures separated from each other by corrals or plazas. One hamlet, two open sites, and three cave occupations were found at lower elevations in the region; furthermore, many of the modern puna-herding hamlets also contain Argalla pottery, which suggests that they too were occupied during this time. A cluster of sites in the Huanta sector shows a slightly different pattern. There was a large defensible compound town on the valley floor surrounded by two hamlets and two camp sites located along streams emptying into the Huarpa River.

During the early part of the period, it appears that the social and political systems were completely disorganized with only a remnant population remaining in the region, perhaps under the political control of the old Huari royal lineages, the importance of which were much diminished from the preceding period. Later, there may have been a series of warring ethnic groups and/or extended kin groups ruling small territories from the fortified, feudal-like towns. Herding became a very important part of the subsistence system. There seems to have been little overall organization of the area as a whole and few definite defenses against raids from each other or from outsiders.

Interactions

This was a period of considerable regionalization in central Peru; however, it does not seem to have been a time when the inhabitants of one region were completely isolated from those adjacent areas. On the west side of the Andes, the self-sufficient archipelagos of lands controlled by various ethnic groups imply that coastal peoples had to deal in some minimal fashion on a day-to-day basis with groups from the Huarochiri Region. These interactions apparently ranged from seemingly peaceful co-existence perhaps with a few insults exchanged, on the one hand, to open feuds and raids, on the other. Contacts between the inhabitants of the Huarochiri and the Huancayo-Junin Regions probably occurred in the punas located along the continental divide. Both groups were involved to some extent in llama and alpaca herding on the punas, and there is a limited number of places on these grasslands where water and salt can be obtained. As a result, it is not unlikely that individuals from the two regions occasionally encountered each other in localities where these resources were available as they do today. The situation in the Mantaro Valley, at least with respect to raiding and feuds, seems analogous to the one that existed on the western slopes of the Peruvian Andes.

## Period 14: ca. A.D. 1425 - 1534

Towards the end of the fourteenth century, there seems to have been a further decrease in the amount of rainfall throughout the central Andes. In densely populated areas this probably meant that some of the marginal farmlands were either abandoned because they could not be adequately watered or they were less productive than they had been earlier under slightly wetter conditions. If groups attempted to maintain their standards of living given these conditions, they may well have placed pressure on the food resources that were available to them. Several groups alleviated this situation by acquiring additional lands and sources of water in adjacent areas. Ultimately, one of these groups, the Incas, established an empire that included most of the central Andes. Given the location of provincial Inca capitals, the relative abundance of Inca remains in some areas and their virtual absence in others, it is clear that the Incas were much more interested in some regions than in others. In fact,

in many areas--e.g., Huarochiri or Ayacucho-Huanta--it is difficult to discern the Inca presence at all.

The Inca political structure was a hierarchical one, usually described as a pyramid. The highest official in the system was the emperor, who not only ruled by divine right but also claimed lineal descent from the sun. One of the great weaknesses with this level of the political system was the lack of a detailed rule of succession to the throne that functioned predictably to designate the heir under any set of conditions. Consequently, succession was frequently associated with conflict, and none of the methods the Incas devised to eliminate such strife was entirely successful. Immediately below the emperor were a series of prefects and provincial governors--offices that were usually held by members of the highest levels of the Inca nobility. The lower levels of the Inca bureaucracy--the kurakas--were probably filled largely by the traditional leaders of ethnic groups conquered by the Incas. It appears that the Incas solved the problem of dealing with a wide range of political systems and various ways of selecting leaders among the ethnic groups they conquered by making succession to these offices hereditary. The sons of the kurakas, particularly those responsible for large numbers of taxpayers, were often taken to Cuzco, where they were indoctrinated into the ways of the Inca state. This insured the loyalty of the kurakas and provided the Incas with a steady flow of trained personnel for the lower levels of their bureaucracy.

The organization of the population of the empire into decimal units administered by the kurakas apparently followed traditional divisions between and within the ethnic groups incorporated into the state. Consequently, these decimal units were mono-ethnic in composition. This reflects the Incas' concern with collecting taxes that were owed by the ethnic group as a whole rather than by the individuals that belonged to it. Since taxes were paid in the form of labor, this was designed to provide the kurakas with a way for raising a sufficient number of men to meet the demands of the state. The Incas imposed two kinds of labor taxes. The first was the mita, which consisted of a specified number of man-days of labor in the army, on public works projects, or in personal service to the emperor or other members of the Inca nobility. The other was a form of agricultural and pastoral taxation, in which the members of each ethnic group were required to work the lands and care for the herds that had been taken from them by the Incas. The products of this labor were used to support Inca government, the state religion, and the members of any royal Inca corporation that controlled resources in their territory. The amount of resources controlled by the Incas varied considerably from one place to another in the empire. In some areas, like Arapa in the Lake Titicaca Basin, the state religion controlled everything that was produced, while in other areas, the largest shares went either to the state government or to one of the royal corporations. The remainder of the resources produced in a given area belonged to the ethnic group whose members did the actual

work; however, no group was allowed to keep more resources than its members needed to sustain themselves throughout the year. In times of famine or drought, the Incas distributed food and other commodities to the effected groups from the state-owned lands; these goods were stored in state warehouses that were located throughout the empire.

The Incas demanded complete obedience from their subjects and used officials and institutions outside of the pyramidal political structure to insure that they received it. These include: inspectors who insured that tax obligations were being met and that rebellions were not being fomented; judges who punished crimes against the state--e.g., wichcraft against the emperor or failure to pay taxes; mitimae, segments of ethnic groups resettled on the lands of others, who were required to set examples and provide the state with information about the activities of their "hosts;" the enshrinement of local huacas in Cuzco; army garrisons stationed throughout the empire; and fear. In spite of all the precautions the Incas took to prevent rebellions, it is clear that they occurred with increasing frequency, as the geographical expansion of the empire began to slow down around the beginning of the sixteenth century and the demands of the state, the church, and the royal corporations for access to resources continued to grow. This continually increasing burden on the ethnic groups was a source of growing dissatisfaction, as the members of the conquered groups saw more and more of their resources and labor drawn off by the state. The Incas were unable to deal with the frustrations that must have accompanied their growing demands. Too many provincial officials in the lower echelons of their bureaucracy belonged to the ethnic groups that had to meet them. When conditions became too oppressive and rebellions broke out, they sided with their kinsmen against the central government. This dissatisfaction is one of the reasons why so many Andean peoples, who remembered when they were free and what Inca rule meant, later became close allies of the Spaniards.

## The Ancon-Chilca Region

About A.D. 1425 a single local ceramic style began to be used throughout the region. This style had its antecedents in the pottery that was manufactured in the Rimac-Lurin Valley sector during the preceding period. This change may reflect the increased importance of the oracle at Pachacamac throughout the region--a set of events that was perhaps precipitated in response to the expansion of the Inca and Chanca states in the south highlands and the Kingdom of Chimor on the north coast.

Ethnohistorical sources are seemingly contradictory concerning the southern boundary of the Kingdom of Chimor. One source places it in the Huaura Valley, and the other in the Chillon Valley. According to Calancha, the southward advance of Chimor was halted when their armies were defeated by the people of the Rimac Valley. This battle probably occurred during the 1450's. The complete absence of Chimu in influence in the Chillon Valley between 1425 and ca. 1476

suggests that the northerners had only marginal control of the area, at best, and that even this probably lasted no more than a few years. Chimu influence dating from 1425 to 1476 is evident in the Huaura Valley suggesting that the actual boundary of the kingdom was located in that area. What the data from the central coast suggests is that Chimor was in the process of expanding southward by raiding neighboring groups on the frontiers of the kingdom when they became involved with their allies at Cajamarca and were eventually attacked by the Incas shortly after 1461. After the collapse of the Kingdom of Chimor, the Ancon-Chilca Region was incorporated, apparently peacefully, into the Inca Empire about 1469-1471.

Subsequently, the prestige and influence of the oracle at Pachacamac increased enormously, and by 1534, they extended beyond the northern limits of effective Inca political control in Ecuador. This was accomplished through the establishment of a series of branch oracles in various localities, a representative of the oracle that travelled at all times with the Inca emperor, the responses given to the inquiries of the wealthy and important pilgrims that journeyed to Pachacamac itself or to one of the branch oracles, and the collection of "tribute" from towns along the coast as far north as Tacumez, Ecuador--presumably in return for the services provided by the oracle. The spread of Pachacamac influence was certainly facilitated by several factors: the religious tolerance of the Incas, their policy of building temples throughout the empire, the relocation of ethnic groups, and the relative peaceful conditions that prevailed in the central Andes during this period.

The population of the central coast reached a maximum during the later part of this period. An ethnohistoric source indicates that there were approximately 30,000 taxpayers belonging to the ethnic groups that had their core lands in the lower parts of the Chillon and Rimac Valleys. Depending on the multiplier factors used to estimate the total population from the number of taxpayers, 90,000 to 150,000 persons probably belonged to these groups; however, it is not clear that all of these individuals resided in the area. Some of them may have been mitimae living in other parts of the empire and some of them may have resided on lands outside of the core territory. Given the fact that there were mitimae from other areas living on the central coast, these figures may not be bad estimates of the total population of the lower Chillon and Rimac Valleys at this time. Using total site area as the major criterion of population size, the population of the lower Chillon and Rimac Valleys at this time was roughly the equivalent to the population of the same area about A.D. 450. This level was not reached again until the early years of the twentieth century.

The settlement patterns of the region remained unchanged during the first 50 years of the period, prior to the time when it was incorporated into the Inca Empire. Towns were located along the edges of the valley or on the lower slopes of isolated hills on the valley floor. However, after the establishment of Inca political control, there was a marked change in both the location and kinds of sites

found in the lower parts of the Chillon and Rimac Valleys. The old towns were abandoned, and new ones were built on the valley floors. Villas--large tapia-block structures built on natural mounds or old structures--were located on the valley floors or just outside of the irrigated fields. There was no appreciable change in the indigenous settlement patterns in the Lurin Valley. Many of the old towns continued to be occupied throughout the period.

The Inca presence is most apparent at their provincial capital at Pachacamac. A Temple of the Sun was built on an ancient pyramid overlooking the shrine of the Pachacamac oracle, and other structures, including one with Cuzco style stone masonry, were built in the same part of the site. Cuzco Polychrome pottery, as well as local imitations of it, are more abundant here than at any other site on the central coast. Tambos, or way stations along the Inca highway, were built at several localities along the road which ran from Pachacamac through Huarochiri to Jauja. Again, the Inca presence is more apparent at the tambos, judging by the higher proportions of Cuzco Polychrome pottery and imitations of it, than it is at nearby habitation sites where only local pottery has been found.

## The Huarochiri Region

One site in the Huarochiri Basin and three sites in the Ricardo Palma sector of the Rimac Valley date to this period. The Huarochiri site consists of a large architectural complex located on a series of low rises near the modern town of Sangallalla. The three sites in the Ricardo Palma sector were functionally distinct and separated from each other by about 700 to 1,500 meters of arable land. One was a settlement, located on an alluvial fan outside of the arable land, with densely packed residential structures. The pottery found at this site belonged almost exclusively to the local style. The second site, located on a hillslope overlooking the valley floor, consisted of a series of coca-drying terraces, storehouses, tombs, and a single large residential compound. Both imitation Cuzco Polychrome and local pottery were found at this site. The third site consisted of four platform mounds overlooking the junction of the Rimac and Santa Eulalia Rivers. It yielded local pottery, as well as a few fragments of the fancy coastal style that occurs in high frequencies at Pachacamac. Huarochiri style pottery, presumably dating to this period, has also been found in considerable quantities around one of the compounds near the southern edge of Pachacamac.

It appears that there was a marked change in the settlement patterns of the region around A.D. 1500, when the inhabitants of both the Ricardo Palma sector and Huarochiri Basin moved from the old dispersed settlements to nucleated villages. This change was probably a direct result of Inca political control in the region. In the Ricardo Palma sector, it seems likely that the local representative of the Inca government resided in the residential structure near the drying terraces.

Ethnohistoric sources provide considerable information concerning the ways in which the oracle at Pachacamac exerted his influence in the Huarochiri Region. A branch oracle in the upper Lurin Valley was one of Pachacamac's sons; the oracle in the Ricardo Palma sector was his wife; she also had a son who was an oracle living in the upper part of the Lurin or Mala Valleys. Pachacamac's son claimed to protect the inhabitants of the area. In return for this service, they built him a shrine and set aside one month each year when they honored him with sacrifices and gifts. After a number of years, the branch oracle was removed from the Huarochiri Region and taken to Pachacamac. The local residents wanted their huaca and went to Pachacamac with gifts of llamas, guinea pigs and cloth to gain his return. After the huaca was returned, they gave llamas and pasturelands in the puna to Pachacamac and honored him and the branch oracle on alternate days with sacrifices and gifts.

## The Huancayo-Junin Region

The Incas were very interested in this region and incorporated it into the Empire shortly before A.D. 1461. Subsequently, they established a provincial capital at Jauja. Ceramic assemblages dating between A.D. 1461 and 1533 contain a variety of styles: Arhuaturo-Inca, which is derived from the local pottery tradition, but which also is an innovative style in that it combines features of Cuzco Polychrome and the local style in novel ways; Cuzco Polychrome and local imitations of the Inca style; Viques, a style which seems to have its antecedents in the Huancavelica Region and which fairly clearly has been imported by a mitmaqkuna group from that area; and a smoked blackware apparently associated with Pachacamac influence.

There was a marked shift in both site location and numbers during the Inca occupation. Many of the sites, constructed after the region was incorporated into the Inca Empire, were located on the valley floor or on the lower slopes of hills surrounding the region in contrast with the pattern of the preceding period when the majority of the settlements were located on the upper slopes or tops of hills overlooking the valley. The initial Inca occupation was in the southern end of the valley primarily; an important Inca administrative center was built near Chupaca but was subsequently abandoned, presumably eclipsed by the growing importance of Jauja. Later Inca influence was spread uniformly throughout the valley, with 126 Inca period sites regularly spaced throughout the valley. Strangely, only two of the sites show any evidence of Cuzco-style stone masonry--a bridge across the Mantaro River and the tambo associated with it, and some of the structures in the provincial capital of Hatun Jauja.

The temple of the oracle of Wariwilka was extensively refurbished under the Inca rule; no doubt its ties as a branch oracle of Pachacamac were re-established at this time. Pachacamac influence is evident in settlements near Hatun Jauja, and Jauja was the end of a lateral branch of the highway which originated at Pachacamac.

The population of the valley was relatively high at this time, being placed at 30,000 Huanca households by the Inca census. In addition to these huanca households, there were a number of mitmaqkuna transplated to the valley by the Incas. These sites are marked by the occurrence of intrusive Viques style ware, which has its closest similarity to groups in northern Huancavelica, but the occurrence

of Cuzco Polychrome and its imitations, and by occasional occurrence of Arhuaturo-Inca ware. The sites are nicely clustered along the east bank of the Mantaro near Viques and have distinctively different lithic industries and settlement types. Ethnohistoric identification, however, is still lacking.

The Jauja-Huancayo basin was no doubt primarily integrated into the Inca state as a center of production of agricultural produce; the elaborate storage systems attached to nearly every occupation site in the valley give mute evidence of its importance. Herding, however, also retained its importance. The Huanca were one of the few groups who paid part of their tribute to the Inca state in terms of herd animals, and they were also a major staging area of trade caravans for the state and of provision caravans for the army; more than 120,000 caravan llamas were available in the area of Jauja alone.

## The Ayacucho-Huanta Region

Cuzco Polychrome sherds or local imitations were found at three hamlets, one open site, and in one compound of a hilltop fort that was occupied during the preceding period. The Ayacucho-Huanta Region was largely abandoned during this period and seems to have been a cultural backwater in the Inca Empire, which played little or no role in the imperial scheme.

## Interactions

The four regions were integrated with each other and with other regions by the political economy of the Inca Empire. The Incas moved mitimae groups throughout the Empire, and these individuals had to deal at least minimally on a day-to-day basis with the inhabitants of the regions where they were resettled. In addition, two and possibly three of the regions were tied together by the influence of the Pachacamac oracle which created a self-sufficiency sphere which extended well beyond the limits of central Peru. The priests at Pachacamac were particularly adept at using the opportunities provided by Inca imperial policies to further their own goals and ambitions. Because of the power wielded by the oracle and his "relatives" in other regions, they were ultimately able to undermine precisely what the Incas were trying to create: a politically unified ruling class that resided in Cuzco.

# CHAPTER III

## CONCLUSIONS

In the preceding pages, we have presented a series of essentially synchronic pictures showing what happened in four regions of central Peru at various times in the past and how their inhabitants interacted with each other during these periods. There is clearly a great deal of variation in these pictures in both time and space. Each region is distinctive, showing some peculiarity in cultural patterns which prevailed there at any given moment and in the processes that led to their development. It is equally clear, however, that there was some relationship between these patterns and processes, and that there were some common themes running through all of the regions.

There were and are significant environmental differences among the regions not only in terms of the environmental potential--i.e., the range and amount of natural resources present within a given area--but even in how the potential changed through time in each of these regions. Some of the resources, particularly mammals such as deer and camelids, were present in all regions, but with radically different frequencies. The land mass-biomass ratio ranged from that of the Junin-Huancayo Region or humid woodlands at Ayacucho where it was very amenable to easy exploitation by man, to the other extreme in the coastal region where it was considerably less favorable to man's endeavors. Also, even though our paleontological and zoological studies are woefully inadequate, it would appear that the number of species and the size of mammals has noticeably diminished since Pleistocene times in each of our regions, again probably in varying proportions. The fairly numerous finds of a number of species of sloth, camelids, equus, large cats, and others in Pleistocene contexts in the highlands far outnumber those from the coast which has been both more intensively explored as well as lived in by modern man.

However, besides this difference that is of a quantitative nature, there are others that are definitely qualitative. An obvious one within this latter realm is the marine resources that are unique to the coast. Plants again are found in all the regions, but again they occur in varying amounts and often are of very different kinds, with certain regions having plants potentially domesticable or able to be cultivated, such as potatoes, squashes, quinoa, beans, etc. The occurrence of wild cavia, potentially domesticable, in one of the micro-environs of Ayacucho would be another somewhat analogous example in the zoological realm.

The third major difference in terms of environmental potential concerns the relationship of natural elements that compose the ecosystems or micro-environments of the ecosystem of each of the four regions we have considered. Moseley, Patterson, Tosi, and others have classified the coastal regions into a series of interrelated micro-environments, such as the lomas, sandy deserts, rocky points, seashore bays, river deltas, mid-river environs, up-river environs,

etc. Unique to this sort of ecosystem is the fact that most drainage of the coast has the same set of micro-environs, with almost monotonous uniformity. Many, if not all, may be reached with relative ease from particular strategic spots; and finally, one or more of them has abundant foodstuffs seasonally or continuously.

This type of ecosystem or ecosystems, which have been called those of a "lush uniformity" contrast markedly with those of the highlands which all are rather different from each other, but still do have some general features in common. All are in mountain-valley situations where the varying micro-environs have a more or less vertical or layercake-like relationship to each other and rarely is there a strategic spot which allows one to exploit all with great ease. Secondly, due to varying elevations, climate, soils, and other ecofactors, each one of these valleys has a rather different set of interrelated micro-environs, although one or more of them may also occur in some of the other systems. Thus, while the Huancayo-Junin Region and the Ayacucho Region both have as micro-environs high and low puna zones, Junin-Huancayo has grasslands and lush river zones that do not occur in Ayacucho while the latter has humid woodlands, thorn forest scrub, thorn forest riverine, and xerophytic zones which do not occur in the former regions. In fact, the factor that all have in common is variability, both with their ecozones as well as between them. These highland ecosystems, while showing great diversity in food potential for their various micro-environments, unlike the coast, generally do not have any particular one (or ones) that may give much greater returns with little energy input, and this contrasts markedly with all the others. Thus, in terms of environmental potential, the Central Peruvian Interaction Sphere has some quite distinctive aspects.

However, in terms of cultural developments in this sphere, it is not the environmental potential that involves culture change, but rather the carrying capacity of the environment that is governed at least in part by the cultural factor. By carrying capacity, we mean the resource potential of one natural environment relative to the existing economic structure and measured by the long-term population support capacity.

Two interrelated factors determined the carrying capacities of these regions. One was the inhabitants' perceptions of what constituted resources in their environmental settings and their abilities to exploit these elements. The other involved the natural endowments of each region in terms of the availability and abundance of these culturally defined resources--whether they be deer, water, or potentially arable land. It is also clear that these carrying capacities varied considerably from one region to another and that they changed through time as new economic orientations and environmental conditions emerged. For example, given roughly similar agricultural economic orientations, the carrying capacity, and therefore the total population of the Huancayo-Junin Region would exceed that of Huarochiri

simply because it has much more land that can be successfully farmed. It is equally obvious that the carrying capacity of the Ancon-Chilca Region increased tremendously after its inhabitants adopted a series of food-producing innovations between about 2500 and 1500 B.C. or that the carrying capacity of the Ayacucho-Huanta Region diminished considerably after about A.D. 950 because of the deforestation, soil erosion, and temporary desiccation which had deleterious effects on agricultural production in the area.

Ultimately then, the carrying capacity of these regions were in large part determined by the size and concentrations of the human populations, the environmental potential, the subsistence option available or developed and their subsistence strategies. By subsistence strategy, we mean the conscious or unconscious adoption of a particular pattern of scheduled subsistence options. Scheduling being defined as the hierarchy or priorities resulting in the temporal order of selected subsistence options, such as hunting, gathering, horticulture, etc., etc. Now, let us look at archaeological data and the various regional developments in terms of the strategies used through time in these various environmental zones.

Any reconstruction of the earliest remains in central Peru must be for the most part based on the findings in the Ayacucho basin, and even materials in the Pacaicasas and Ayacucho horizons is very limited. However, a study of the distributions of the artifacts and ecofacts from the six earliest strata show 11 activity areas that seem to represent as many occupations by microband groups--three or less nuclear families and/or linked individuals. Further paleontological and pollen studies suggest that these occupations occurred during periods when the environment around the cave was woodland as well as grassland. Analysis of ecofacts in the five clusters of zone h suggests that two of these occurred in the dry season, while three were in the wet season. However, a study of the ecofacts and artifacts to determine what their subsistence patterns were, and even what their hierarchy of priorities was (conscious or unconscious), among their subsistence options reveals that without regard to season or eco-zone--hunting (in their lair) of great sloth, ambushing or stalking of medium-sized (herd) mammals, the taking of small mammals by trapping or collecting, and perhaps nonspecialized plant collection occurred in this listed order of popularity. This suggests that these peoples, while they had scheduled subsistence (a hierarchy of priorities of selected subsistence options) they did not have a system with seasonality, for we would define seasonality as connoting cyclic (seasonal) variation of the exploitation of natural resources. Further, our reconstruction for this period of the human population and its relation to the relatively large Pleistocene animal population suggests that only a small portion of the environmental potential or its carrying capacity in terms of their subsistence options was being exploited.

Taking all the above factors into consideration, we would like to suggest that the people of this stage had a satisfycing subsistence strategy without seasonality--that is, they had a strategy that aims at deriving less than the highest possible level of their defined objectives (i.e., getting the largest amount of food or other resources) for reasons of risk or social interaction. One might speculate that concepts in their ethos revolved around values that were concerned with not working too hard, having a moderately full belly, and not worrying about being rich in the material sense. Whether this type of strategy pertained to that of people living before 20,000 years ago in Central and North America or, for that matter, in the Middle and Lower Paleolithic of the Old World remains to be seen. Be that as it may, we believe that the collection and analysis of early data to test the existence of such a hypothetical strategy is a worthy avenue of research.

Our archaeological evidence from central Peru suggests that a new but related type of subsistence strategy came into being about 9000 B.C. and continued up until about 5600 B.C. Again, our evidence from Ayacucho is slightly fuller than that for other regions, but even in these other regions there are some hints at what type of strategy is in use. Since from Ayacucho more abundant information has been more completely analyzed, let us consider it first. The Puente and Jaywa phases seem to belong to this stage and their subsistence options were not very different from those previously utilized. Hunting of camelids, deer, and other large mammals by the ambushing or stalking techniques continued, albeit with finely-made bifacial projectile points, perhaps attached to better weaponry. More small game was taken by either trapping or collecting and many of these were guinea pigs. Since the present habitat of cavia is at high altitudes and since most of the archaeological specimens come from low elevations, there is a suggestion that some of them in the Jaywa period were tamed--that is, man has changed the ecosystem or environment of the animal; i.e., he moved them from high to low elevations. A few stems of berries, grass-seeds, and fiber or leaves, as well as grinding stones suggest that other options were seed-picking, fruit-picking, and leaf collecting. The major difference from the previous stage, however, is that now these options seem neatly scheduled both as to season as well as to micro-environment--hunting with a little trapping and plant collecting at high elevations during the dry season, while in the wet season at low elevations man either did much collecting (or penning) of small game and/or collecting of seeds with only a little hunting or fruit collecting.

Although our coastal data is less precise and the options were different, a similar seasonally scheduled satisfycing subsistence strategy was also employed. It would seem that during the dry winter months, one collected shellfish or other marine resources and a few plants on the coast, while in the foggy summer months one collected plants and/or animals as well as engaged in hunting in the lomas or river valleys. The date from Tres Ventana suggests a somewhat

similar transhumance pattern with hunting being a major activity at high elevations in the wet season and collecting marine resources on the coast in the dry season. Our data is too incomplete to discern the pattern for the Huancayo-Junin Region, but even so, the three other regions are strikingly similar. Since this strategy aimed at deriving less than the highest possible level of subsistence objectives and even though human populations were increasing as the animal biomass decreased, it still might be termed a satisfycing strategy, but it was different from the previous stage, for now it had seasonality.

Of course, some groups may have continued using the old satisfycing strategy without seasonality, but even so, there were great similarities in the various regions of the Interaction Sphere. Although both these strategies may have continued in use in some or all regions, there are major regional differences in the strategies which began to appear in the next stage--roughly from 5000 to 4000 B.C. On the coast, the location of hamlets or base camps at points tangent to a number of micro-environs with their varying food resources still exploited by the older collecting subsistence options would seem to represent a new subsistence strategy. This new pattern we would term a more efficient collecting subsistence strategy, and by a more efficient strategy we would mean one that aims at deriving the highest possible level of the definite objectives (getting food easily) which can be maintained over a long period of time in view of the attendent risks (which would be slight). Again, some of the Ancon and Lurin areas where food resources were more widely spaced would see the continuation of the older satisfycing strategies.

While these older strategies may have also continued in the Ayacucho basin, new ones appeared that are radically different from the dominant one in the central coast. These new highland strategies were related to new subsistence options, such as horticulture and pastoring which, in turn, were involved with the domesticated plants and animals, as well as cultivated plants and tamed animals. Since all the above terms are used in a variety of ways, we deem it necessary to give one definition of them. By horticulture we mean an activity with an emphasis on the planting of individual domesticates or cultivars in relatively limited plots (horti = gardens). A domesticate we would define as a plant or animal that has changed genetically due to man's selection (conscious or unconscious) which makes it genetically different from its wild ancestor. A cultivar or tamed animal results when man has changed (consciously or unconsiously) the ecosystem, habitat, or environment of a plant or animal, so that while this may result in morphological changes, it does not change it or them genetically from their wild ancestors. Pastoring (pascere = to feed or tend beasts) would be like horticulture in that it is an activity which emphasizes the use or habitational contexts of an animal.

Now to return to the new subsistence strategies of the Piki phase of Ayacucho. One of these would involve the pastoring of tamed guinea pigs on sites at low elevations during the wet season or for longer periods of time. The other would be more concerned with horticulture and the growing of domesticated squashes, gourds, and quinoa, and possibly cultivated quinoa. Both could give possible relatively large yields of food, but drought, predators, disease, etc., as well as interference with their normal seasonally scheduled subsistence pattern would make the risks relatively high. Thus, we would classify their strategy as being an optimizing horticulture and/or pastoring subsistence strategy. Optimizing strategy being defined as one that consciously or unconsciously, for a long or short term, aims at deriving the highest possible level of the defined objective without consideration of potential risk.

Although our data is woefully inadequate for the Junin or Huarochiri Regions, the bones of what seem to be domesticated llamas and alpacas from Pachamachay Cave in the former region hints that an optimizing pastoring subsistence strategy might have been employed; while the sea shells and coastal plants in the upper pre-ceramic levels of Tres Ventana Cave suggest that the older Satisfycing Seasonal Subsistence Strategy continued.

The next stage from slightly before 4000 B.C. to about 2500 B.C. would again see new regional strategies coming into being, but some or all of the older ones may still have continued. The coastal area sees relatively little change, but the planting of domesticates was now added to their already rather successful collecting of wild foodstuffs. This strategy we have called a more efficient horticulture subsistence strategy. In Ayacucho the Chihua phase witnessed the rapid acquisition of many new domesticates, including corn and beans in the later part of the phase. These remains we consider to be evidence of agriculture, probably of a variety of types such as seed agriculture, root agriculture, and agriculture itself. Let us hasten to add that we would define agriculture as an activity with an emphasis on the planting or sowing of multipropagators of domesticates or cultivars in relatively large plots or fields (agri = fields). Although yields could have been relatively large but usually not large enough to last all year when there were heavy rains in the summer months, there is in Ayacucho the possibility of drought, so the risk factor was also relatively great. Thus, one of their strategies might be called an optimizing subsistence agriculture strategy. It might be added that the pastoring of guinea pigs continued in diminished degree, but our metrical analysis of their bones suggests they were domesticated, not just tamed.

Exactly what the subsistence strategies in the Junin-Huancayo Regions were is more difficult to determine, but the presence of hoes and grinding stones does suggest the possibility of some sort of agriculture or horticulture, which at these high, cold altitudes was probably at best of an optimizing nature. However, one of the most

distinctive features of these components is the abundance of juvenile camelid bones. Even without evidence of corrals for this period, this suggests the herding of domesticated camelids for meat. We use the term herding instead of pastoralism or nomadic pastoralism or various other terms for this subsistence option for the simple reason that the Webster definition of it is less ambiguous. It defines herding as "activity that feeds, runs together, or assembles a large number of tame or domesticated animals." Whether this subsistence option in the very high altitudes was involved in an optimizing or a more efficient strategy remains to be seen, as does the strategy or even the subsistence options of the Huarochiri Region.

Strategies after 2500 B.C. become more similar once again in that they have a tendency to become more and more efficient, but the regional differences continue to occur and a new factor that might be termed redistribution of basic resources is crucial in each one of them.

On the coast, in the stage from roughly 2500 to 1000 B.C., we see the gradual shift from horticulture to agriculture in certain riverine situations while the older efficient maritime collecting activities continue on the coast. Further, those two efficient subsistence systems become welded into a single (horizontal) economy by collecting the maritime and agriculture produce in certain centers and then redistributing it to all the linked local communities in this chain, often in a single drainage system. This has been dubbed a sort of mini-interaction sphere with a horizontal economy. On the coast, there is the suggestion that many of the redistribution centers have religious overtones. This might be termed an efficient agriculture subsistence strategy with local horizontal redistribution.

Although we have few hints as to the sort of strategies used in the Junin-Huancayo or Haurochiri regions, there is some evidence that an efficient agricultural-herding strategy with local vertical redistribution had developed in the Ayacucho-Huanta region. Here, a herding-root crop subsistence system at high elevations had been linked, perhaps along kinship or ceremonial lines, with a low level seed agriculture system.

Between about 1000 and 450 B.C. there is once again a shift in efficient subsistence strategies, with the local distribution centers of the products of the different subsistence systems becoming definitely of a ceremonial or religious nature. On the coast, major valley irrigation systems were constructed while only a few faltering steps were taken in this direction in the highland regions under consideration. However, besides these exchanges of basic foodstuffs on a local or sub-regional basis, another super exchange system or sub-interaction sphere occurred late in this stage which was concerned with the Chavin cult. The coastal region, and the Chavin de Huantar in the highlands itself, seem to be very closely linked, perhaps by economic, social and religious exchanges, while the other regions

under discussion seem only to have been influenced by the unifying force called Chavin. As yet, we do not fully understand how this cult phenomena operated in terms of subsistence or exchange strategies, but we have the feeling it was somehow connected with them for some basic foodstuffs and domesticated plants spread throughout the whole interaction sphere.

The cohesive force of Chavin breaks down during the next stage, 450 B.C. to 600 A.D., and efficient regional or multi-valley economies and subsistence strategies come into being. Irrigation becomes of increasing importance everywhere as does llama herding and the raising of animals for both their wool as well as for their use as pack animals. In terms of exchange and distribution, a new system seems to be now important particularly in the highlands and it was connected with warfare or military activities with the resultant flow of goods as booty, tribute, and taxes.

The final stage, 600 - 1500 A.D., was obviously the outgrowth of the previous one, and while local and regional economies changed little, and still may have kept their local flair, the exchange system and the total economic system was pan-regional under the control of Imperialistic States (such as Huari and Inca). This was an efficient area subsistence strategy run by the imperial rulers. Even here though the strategies of the coast and the highlands were slightly different, for the conquered were usually in the former regions and the conquerors in the latter.

Thus, once again, we have seen that in ancient Peru not only were there quantitative variations in terms of different archaeological sequences in regional phases, but qualitative differences in terms of different subsistence and exchange strategies. Although our data is woefully inadequate, what seems to be emerging is a model showing that a pristine civilization developed because of the interstimulating interaction between these developing systems. And now we get to the nitty-gritty of trying to explain not only how and why pristine civilization developed in central Peru, but anywhere.

Are not the necessary pre-requisites or necessary conditions for the development of the Peruvian pristine civilizations the following: a continuum of life or natural zones ranging from one end of the dichotomy that has relative ecological uniformity or repetitiveness--i.e., a specific number of micro-environments that are similar from one adjacent region to the next, like each valley of the Peruvian central coast with its coastal bays and points, river deltas, mid and upper river environs, lomas, and deserts separating one valley from the next. Further, zones in this end of the range tend to have relatively limited seasons (a wet and dry one) and also such zones usually have one or more micro-environs that has large amounts of potential foodstuffs that can be relatively easily gathered at all or most seasons of the year.

Zones with the above characteristic contrast with ones with relatively ecological diversity and little repetitiveness from one region to the next, like Ayacucho with its high puna, low puna, humid woodlands, thorn forest, thorn forest riverine and xerophytic and Junin with high puna, low puna, grassland, and gallery forest riverine. Further, these zones have relatively great seasonality not only for the regions as a whole but the micro-environments within it, as well as a few potentially domesticable plants or animals in one or more of its micro-environments that, generally speaking, are harsh and only yield gatherable foods in limited periods of the year. A further characteristic of these pristine nuclear areas seems to be that these environmental zones ranging from one end of the dichotomy to the other be of such geographical positions so that they are relatively accessible to each other (and so that interaction between them can be accomplished with relative ease).

In general terms, does this not describe our Central Peruvian Sphere? However, even more important, does it not describe two of the other areas where pristine civilization arose - Mesoamerica and the Near East? Are not some of the subdivisions of the "Tropical Lowlands" of Mesoamerica such as (11c) Los Tuxtlas or (11b) the Veracruz-Tabasco rain forest or (12e) coastal lowlands of southwestern Mexico in terms of the above general characteristics like our Peruvian central coast, and are not the (7) Mesa-Central with arid rain-shadow strip (7a) like the other end of the range of the Peruvian dichotomy--the Ayacucho Valley (West 1964)? The article by Coe and Flannery (Coe and Flannery 1964) contrasting the ecology of the Ocos coastal area of Guatemala with the Tehuacan Valley of highland Mexico, if compared with the earlier parts of this volume, indicates just how similar the general characteristics of both areas are.

The Near East also shows similarities in terms of the above necessary prerequisites to both these above-mentioned areas of pristine civilization. For example, the coast or nearby Desert Oasis of the Levant, or even the Flanks of the Tigris and Euphrates typify areas that contrast with the high valleys of the Zagros and the hills of Turkey in ways similar to our Peruvian and Mesoamerican dichotomy (Hole, Flannery and Neely 1969). Thus, our centers of civilization do have some distinctive characteristics that are not shared by other major portions of the world such as the Plains, Arctic, Boreal and other zones with their few, if any, potential domesticates. Nor do these areas have temperate or tropical zones adjacent to each other. One can, of course, find other parts of the world with zones having the prerequisite characteristics of Peru, Mesoamerica, and the Far East which did not develop into pristine civilizations, and we believe that the reason this did not happen in these cases is that all the sufficient or triggering conditions did not occur in exactly the right sequence.

The first set of triggering of sufficient conditions in the Central Peruvian Interaction Sphere (at about 7000 to 8000 B.C.) would

be the development of a number of new subsistence options--plant collecting and trapping in Ayacucho, shell collecting and perhaps fishing and plant collecting in Chivateros which would supplement their basic hunting economy and satisfycing subsistence strategy. At the same time, this would set up a negative feedback system which would interact with, the diminution of the biomass at the end of the Pleistocene, i.e., the extinction of the "big game animals".

Given the two dichotomous environmental prerequisites, the results lead to at least two rather similar developments. In the lusher coastal area, a quite successful scheduled seasonal subsistence system occurred involving hunting and collecting in the wet season in the loma or adjacent Andean flanks, and hunting and marine exploitation on the coast or river valleys during the dry season (Arenal-Luz). In contemporaneous times in the highlands, there was the Jaywa pattern with puna winter season hunting, spring and summer thorn forest seed collecting, trapping and hunting, and fall humid woodland hunting and trapping and perhaps plant collecting. All this produced a well scheduled system but it was probably not too successful. The areas between the dichotomous zones might have even seen slight variations on one or other of the pattern.

For Mesoamerica, the development in early El Riego (MacNeish 1964) seems quite like that of Jaywa, but no lowland comparable dichotomous area has yet been uncovered. In the Near East our data is even flimsier, for we believe that the Zagros period when the climatic change occurred leading to the extinction of the big game between Baradostian at 23,000 B.C. and Palegawa Cave at 13,000 B.C. has yet to be defined (Solecki, R.S., 1964). From the Levant there is some data from cave excavations on this period but it is not complete enough to determine adequately the settlement or subsistence pattern. We might add, however, that some of the process that brought about the eastern United States Archaic, the Desert cultures, or even the European Mesolithic might be comparable to one or other of those developments we see in Peru.

The next step with the same necessary conditions in the same contrasting natural zones, coupled with very slight population increases interacting with the slightly different seasonally scheduled subsistence systems, causes two quite different results.

On the coast, the slightly increasing population brought about greater and greater use of the great sea food potential by improved fishing and shell collecting techniques which brought about increased population which brought about greater use of the sea potential, etc. This negative feedback process led to more and more sedentary life and eventually to the establishment of some sedentary hamlets or large base camps in Canario times.

In Ayacucho, the slightly increasing populations brought about greater use of the various subsistence options in plant collecting

techniques. There were more plants being experimented with, there was more trapping and animal collecting, which in turn begat greater populations that eventually caused some planting of wild plants (such as gourds and squashes) in new environments (cultivars), or the planting of freaks (domesticates), such as the quinoa, or the pastoring of some animals, such as tamed guinea pigs.

This process resulted in the way of life of the Piki phase which had a well-scheduled seasonal subsistence system supplemented by the use of cultivars, domesticates and tamed animals. The contemporaneous information from the Callejon de Hualyas (Kaplan, Lynch and Smith 1973) and the Junin areas suggest that similar processes with other domesticates and cultivars were happening in other highland areas, while more successful food collecting systems possibly with cultivars or domesticates may have occurred in natural zones near the coast.

The Peruvian highland process seems very comparable to what was happening in late El Riego in our zone of harsh diversity in Mesoamerica (MacNeish 1975), but again the Mesoamerican data from the contrasting zone of lush relative uniformity is lacking. From the Near East, comparable data is more difficult to find but the occurrence of storage facilities, boulder mortars, querns, celts and blades with sheen on them, as well as the use of a wide variety of animals in Palegawa Cave (dated roughly between 14,000 and 10,000 B.C.) makes one suspect that Zarzian of that harsh highland Near Eastern region (Turnbull and Reed 1974) may turn out to be quite similar to late El Riego of Mesoamerica and to Piki of Peru. Data from the lowland lusher zone of the Near East is more difficult to come by, but one cannot help but wonder if the prototypes for Natufian in the Levant or the prototypes for the Bas Mordeh phase of Ali Kosh (Hole, Flannery and Neely 1969) or Mureybit (Van Loon 1968) in the Tigris-Euphrates region when found will not be generally similar to Canario on the Peruvian coast.

The changes after this stage in Peru reflect rather different resulting cultural systems, and seem to be due to different causes or sufficient conditions. In Ayacucho in highland Peru in the Chihua phase, 4400 - 3000 B.C., there is some evidence of increasing numbers of domesticates being used in the main due to more and more exchanges with other areas that have domesticated plants and animals, as well as greater improvement of the ones locally utilized which are sufficient conditions for change. This means that horticulture and pastoring supplemented their seasonally scheduled subsistence system. Their subsistence strategy is more of an optimizing nature, groups are bigger and seasonal occupations last longer and longer. In other words, the sufficient causes are an exchange system that effects both their subsistence system and their strategy, as well as their settlement pattern that, in turn, effects their exchange system to bring in more domesticates, etc. A new kind of negative feedback cycle was in operation. Although the evidence is slim perhaps most of the highland regions were going through a similar process, and more domesticated

animals and plants where being utilized in varying proportions in many regions.

On the Peruvian coast, the stimulus for changing the cultural system is very different. It is our belief that sedentarism starting in Canario and continuing into Corbina (4200 - 3700 B.C.) and Encanto (3750 - 2500 B.C.) brings about a major population increase that causes not only the necessity for improving noticeably their collecting techniques but also, near the end of this stage, even the need to use some domesticates (in this case, squashes, gourds, and perhaps canavalia beans) to feed the increasing number of hungry mouths. Again, there is the possibility that as one moves along the continuum from the coastal end of the spectrum toward the Ayacucho situation at the other end of the continuum, early dates for adopting domesticates increase while population pressure factors decrease in importance. Unfortunately, our data from these interventing regions or natural zones is woefully inadequate or lacking.

Comparative data from Mesoamerica confirming these hypotheses is unfortunately biased due to inadequate information. While the situation in the Coxcatlan phase of Tehuacan (MacNeish 1975) is almost a carbon copy in terms of process to what seemingly was happening in the Chihua phase of Ayacucho, there is no information about what was happening in the lusher coastal area of Mesoamerica. From the Near East there are hints that a process similar to that of Peru was occurring, but data from the harsher highland region is poor. The best data we have from the Near East highlands is from Zawi Chemi (8920 B.C. $\pm$ 300 years) (Solecki, R.L. 1964). While there is little doubt that they were utilizing domesticated sheep and perhaps dogs, evidence for the use of domesticated plants is based upon an increase in the gram size of "Cerealia type" pollen and associated grinding stones (Leroi-Gourhan 1969). Such information can tell us little about either the number of domesticated plants or the exchange of them at this period. Obviously, what they need in the Zagros is a cave site like Coxcatlan in Mexico with its fine preservation of plants and human feces.

In contrast the picture for this period from about 9100 to 7200 B.C. from the lusher areas of the Near East is very good, although relying on it obviously eschews any interpretation of the whole area. Natufian, the impressive village of round house hamlets of the Levent (Perrot 1966), the village of Mureybit in the upper reaches of the Euphrates (Van Loon 1968), and a number of others, all without evidence of domesticated plants or animals, date to this period and bear many resemblances to Corbina. Bas Mordeh at Ali Kosh (if it dates to the end of this period), would be like Encanto of Peru for there is evidence of a few domesticates supplementing the basic diet of wild foods of these villagers (Hole, Flannery, Neely 1969). Further, the many stratigraphic levels from Mureybit seem to indicate rapidly increasing populations throughout this period leading to more specialized collecting techniques and eventually horticulture and/or agriculture and a new culture system in the next stage for the lusher regions.

The next stage of development, roughly from 3000 to 1750 B.C., is in central Peru, although sedentary life with agriculture, now a necessary condition for this stage and all later stages, occurs in both of our dichotomous regions. However, there seems to have been rather different sufficient conditions causing the culture system of each to change, and even the types of sedentary agricultural life are really not very similar. On the coast, the influx of many domesticates and agriculture seems to lead to surpluses of food because they already had a successful food-collecting economy which in turn led to local ceremonial centers for the redistribution of both kinds of food produce, so all may have their "ideal of community self-sufficiency". The interaction in a negative manner of the two variables--increasing agricultural and local socio-ceremonial control of the redistribution of these--became the cause of increasing populations and the development of yet another type of coastal cultural system.

In the highlands, early in Cachi time (3000 - 1750 B.C.), the gradual shift from horticulture to agriculture and from pastoring to herding with the resultant self-sufficient exchange system between the low level farmers and high level root farmer-herders goes hand-in-hand with the establishment of sedentary life. As so often happens with the establishment of sedentarism with adequate food produce, there seems to have been a population explosion that made this whole culture system untenable. Thus, the factors for causing change in the two regions in this stage were rather different with population being the sufficient condition in our harsher highland zone, while in the lusher zone, causes triggering a change seem connected with the use of a new agriculture subsistence, interacting in a negative feedback manner with factors in a new socio-ceremonial organization. These later factors have not been well defined by the limited excavations in coastal sites of this period and were probably much more complex than the terms indicate. In fact, we find our statement concerning causes for culture change at this stage and all the later stages most unsatisfactory and we have a definite feeling they are overly simple and quite unsophisticated. This is perhaps due to three reasons. It may very well be that starting at about this time social and ethos factors very difficult to discern in the archaeological record, become increasingly important. Second, the culture systems are bigger and more complex and our archaeological sampling of them becomes proportionately smaller and smaller. And finally, we have a feeling that at about this stage the sufficient conditions become not only more numerous and complex but their relationships to each other also become increasingly more varied and complex.

In spite of our reservations about our understanding of this stage, the period from 7200 to 6000 B.C. in the Near East seems analogous to the Peruvian situation from 3000 to 1750 B.C. The first highland modest hamlets of Gang-i Dareh in the Zagros of western Iran, Jarmo of the Iraqian Zagros, and Cayona in the eastern mountains of Turkey (Braidwood 1968) all have evidence of agriculture, and

domesticated animals are in a general way like Cachi of Peru, while the large agricultural villages with evidence of significant ceremonial activities such as Jericho of the Levant, Halica of Turkey and Ali Kosh of Iraq of the lusher Near Eastern regions seem similar to the first ceremonial center of Peru (Ucko, Tringham and Dimbleby 1972). However, whether population pressures were occurring in the harsher regions of the Near East or whether the agricultural systems interacting with socio-ceremonial changes in the lusher parts of the Near East of this time truly occured remains to be seen.

The other area, Mesoamerica, in which a pristine civilization appeared is so poorly documented at this stage that it is almost not worth mentioning. Abejas and Purron (3400 - 1500 B.C.) in the highlands of Mexico certainly had agriculture and hamlets but both are so poorly defined it is difficult to understand if they were comparable, and Mesoamerican lowland sites are almost totally unknown for this stage (MacNeish 1972).

The next stage in Peru, from about 1750 B.C. to 450 B.C., although it has yielded considerable spectacular archaeological materials, particularly the Chavinoid remains, is not really very well understood in terms of the cultural forces that were in operation. It also would appear that at least by this time most of the basic prerequisite or necessary conditions had changed. Earlier, the more important ones had certainly been of an environment deterministic nature, but by now these factors of dichotomous cultural zones, although they still existed, were at most of a limiting nature, rather than a prerequisite for change.

There is, however, a new factor that is vaguely environmental. This would be when one or more of the natural zones were of such a nature that there was great potential for undertaking irrigation agriculture in a rather productive manner. Following that it was now most important that all cultures involved had an agricultural subsistence base. One of the other prerequisites--that the cultures involved had to be in such geographical positions that they were relatively accessible to each other--still pertained, for culture interaction of an interstimulating nature still seems to have continued.

While we have confidence that the above necessary conditions were of key importance, the triggering conditions which cause the heavily ceremonially oriented culture systems of this stage to change is most difficult, and our answers are extremely speculative.

As we have stated earlier, there is considerable evidence to show that a religious or cult theme permeated this whole stage. Further, we know that during this stage there were two general developments--one in the north central highland and central coast where the Chavin cult grained dominance, and another in the south central highlands where a series of local socio-religious manifestations

controlled rather local or at most regional redistribution systems with only minor Chavin influence.

Let us speculate about developments in the Chavin domain first. There seem to be five general trends that are important in leading to the demise of that culture system. First of all, throughout this period, there is continued population growth both in terms of specific valleys, and also as to the size of the ceremonial centers within these valleys. This is closely connected with a second trend--the increasing use of irrigation. Perhaps rising population brought on the need for using irrigation, that in turn increased the valley populations. In addition this increased the size of the centers managing the irrigation systems. The irrigation factor is, however, connected with still another condition--the increase both in the number and kinds of full-time specialists. On a simplistic level, the full-time specialists seem to have been of at least three different types.

One was the religious practitioners or priesthood who probably already were in existence in the previous stage. Initially, their duties may have been mainly in the line of directing ceremonies, but the number of ceremonies may have increased as did the practitioners. Further, the places (temples, etc.) for the ceremonies also would have grown, as well as the equipment used in the ceremonies leading to more and more full-time specialists in public works and industries. Further, more and more records would have had to be kept (accountants) more calendrical observations made, more accolades taught, etc., etc.

Connected with these specialists would, of course, be those concerned directly with irrigation. At first, they possibly were connected only with organizing local groups, but this would have grown into departments concerned with construction. There would have been record keepers, a legal staff to negotiate water-right disputes, policemen, tribute or tax collectors, etc. Hand-in-hand with this latter economically oriented group of specialists would have been a third group connected with redistribution of not only religious and ceremonial phenomena but also with actual produce. Obviously, as the domain of Chavin grew, so would this group. It also would have grown on the local or regional level as these populations grew and expanded. On a general level it would appear that accompanying these trends towards specialists would be a tendency for their duties to shift from a sacred orientation to a secular one.

The fourth set of factors concerned a growing and perhaps greedier elite who, while being full-time specialists in the political realm, were the ones for whom the other full-time specialists worked. These in turn, exploited the masses not only in terms of raw materials, but also in the redistribution of the basic foodstuffs. This would have meant that through time, the elite moved from specialized sacred beings to secular persons with concerns about property and administration.

Closely connected with these trends would be those who were on a more ethereal level, but who also were connected with the shift from the sacred to the secular. Here, there may have been, especially in the early phases, a tendency for the sacred concerns to have been a cohesive force binding the group more and more together until the Chavin cult flourished. As the system grew larger and more complex and important, the cohesive sacred force gave way to secular concerns and the binding force was lost. We would speculate that these five factors, population increase, large irrigation systems, increasing number of full-time specialists, a growing greedy elite, and the loss of the sacred as a cohesive force acting in a complex negative feedback system (which we don't pretend to really understand) led to fission of this Chavoid cultural system and its development into a series of local regional cultural systems in competition or open conflict with each other.

Factors for change in the contemporaneous cultural phases of highland Ayacucho parallel those of the Chavin realm but are somewhat different for the simple reason that secular concerns seem to have had more emphasis than sacred ones. Throughout this period ceremonial centers appear. The basic concept perhaps had been adopted from the lowland, but they seem to function more as redistribution centers for the produce of the local low level and high level subsistence systems than as ceremonial centers for a large number of elite or full-time specialists, although some of both may have existed. Basically, the prime factor leading to change of this system was increased irrigation concomitant with growing populations that, in turn, as they expanded, led to overlapping and competitive exchange and water control systems. It seems very possible that these disintegrating mechanisms were eliminated in the next stage by secular mechanisms (perhaps of a military nature).

Now the question becomes, just how comparable are these hypothetical mechanisms for cultural change at this stage to ones that occur in Mesoamerica and the Near East? As has been often noted, Olmec, 1500 - 400 B.C., centered in lowland Mesoamerica, has many resemblances to Chavin. As yet, Olmec is not well enough understood to explain the reasons for the demise of this seemingly very viable culture system. However, there is some evidence to suggest that they too had an expanding greedy elite, an expanding number of full-time specialists and a growing population. Whether the latter were connected with irrigation or merely a more viable redistribution system, or whether there was a shift from the sacred to the secular is unknown at present. Further, in highland Mexico in Tehuacan in the Ajalpan and Early Santa Maria phases there is good evidence that growing populations, concomitant with irrigation, were major sufficient conditions for changing these cultural systems (MacNeish 1975). Thus, there are hints that similar necessary and sufficient conditions were operative at this stage in Mesoamerica as well as in Peru.

The situation in the Near East at this stage roughly from 6000 to 4500 B.C. is more elusive and our knowledge of it poorer, yet again there are hints of similarities (Ucko, Tringham and Dimbleby 1972). Certainly, from Catal Huyuk, the earlier levels of Tepe Gawra, Eridu and others there is evidence for the existence of considerable ceremonials or cults, for an expanding number of full-time specialists and elite, as well as for a growing population. Further, from sites such as Tepe Sabz in the middle Euphrates there is growing evidence for early irrigaiton and expanding redistribution centers. Were these the sufficient conditions for changing the culture systems in that area?

The final stage before civilization as represented by the Huari Empire in Peru occurred from about 450 B.C. to 600 A.D. Again, there is insufficient knowledge of this stage in central Peru for us to really understand the crucial conditions that finally brought about civilization. Although the mechanisms are far from clear they do seem similar for both highlands and coastal regions. In many regions there are large sites that certainly could be considered towns, if not cities, and in many areas the major irrigation systems that existed at the time of the conquest (and even exist today) were established. Thus, population and the concomitant expansion of irrigation systems may have been crucial factors for change.

Closely linked to these are the expansion of redistribution networks of relatively large resources with concomitant rise of interregional competition, conflict and militarism. Perhaps these factors interacting together are the sufficient conditions leading to civilization. From many standpoints, the regional entities with their complex divisions of labor, class stratifications (with each stratum marked by a highly different degree of ownership or control of the main productive resources) monumental architecture, towns (and perhaps cities), political and religious hierarchies exhibit most of the hallmarks of civilization. However, there is little concrete evidence that such entities administrated territorially organized states by use of legalized force--our final criteria for civilization which the next developmental stage, the Huari Empire, exhibits in a striking manner.

Without delving into the matter too deeply we cannot help but wonder if the period Braidwood calls the level of towns--with the Urbaid and other cultures from 4500 to 3500 B.C. leading to Summerian --is not directly comparable to the one we just described from Peru (Braidwood 1968). The dates after 450 B.C. in Mesoamerica are more difficult to place in a comparable position. This is in large part due to the difficulty of determining if Teotihuacan, Monte Alban and Tikal are true civilizations, for all these, like the Peruvian stage just described have as yet poor evidence as to the existence of truly territorially organized states. Perhaps, the Mexican centers from 450 B.C. to 600 A.D. belong in the stage we have just described, and a true comparable civilization did not arrive in that area until

the Post-Classic after 700 A.D. Obviously, there are many difficulties in determining what were the final sufficient conditions leading directly to civilization here in Mexico as well as in Peru and the Near East.

Be that as it may, we believe these attempts, premature as they may be, to analyze the sequences of cultural systems leading to civilization and to determine hypotheses about causes of cultural change are very worthwhile. Not only do they give hypotheses for us and others to test but they help define the problems so that new data may be collected to test them. Hopefully then, better hypotheses may be undertaken. We hope, however, that this monograph may be something more than just speculations and hypotheses, and that we have contributed some basic factual information about the Central Peruvian Interaction Sphere that may be of use to other scholars.

# BIBLIOGRAPHY


Bell, R. E.

1965 Archaeological Investigations at the Site of El Inga, Ecuador, Casa de la Cultura Ecuadoriana, Quito.

Bird, J. B.

1969 "A Comparison of South Chilean and Ecuadorian 'Fishtail' Projectile Points," The Kroeber Anthropological Society Papers, No. 10, Berkeley.

Braidwood, R. J.

1968 Prehistoric Men, Chicago Natural History Museum, seventh edition, Chicago.

Braidwood, R. J. and G. R. Willey

1962 Courses toward Urban Life, Aldine Publishing Co., Chicago.

Cardich, A.

1964 Lauricocha, Studia Praehistorica, Buenos Aires.

Cardich, A., L. A. Cardich and A. Hajdak

1973 "Secuencia Arqueologica y cronilogia radiocarbonica de la cueva 3 de Los Toldos, Alta. Cruz, Arg.," Soc. Arg. de Anthro. Relaciones, Tomo VII, Buenos Aires.

Coe, M. D. and K. V. Flannery

1964 "Microenvironments and Mesoamerican Prehistory," Science, Vol. 143, No. 3607: 650-654.

Correal, G.

1974 Tequendema Cave, Bogota, Colombia, unpublished Phd. thesis, Bogota.

da Conceicao, M.

1973 Datacoes Arquelogicas Mais Antigas do Brazil, Rio de Janeiro, mimeographed.

Engel, F.

1966 Agricultura y geografia humana precolombina en la quebrada de Chilca, Dept. de Publicaciones de la Universidad Nacional Agraria, Lima.

1966a "Le Complexe Preceramique d'el Peraiso (Perou)", Journal de la Societe des Americanistes, Tome LV-1, Paris.

1970 "La Grotte du Megatherium a Chilca et les Ecologies du Haut-Holocene Peruvien" in Echanges et Communications in Claude Levi-Strauss volume edited by J. Pouillon and Pierre Moranda, Mouton and Co., Paris.

1971 "D'Antival a Huarangal" L'Homme, Vol. XI, Mouton and Co., Paris.

Hole, F., K. V. Flannery and J. A. Neely

1969 Prehistory and Human Ecology of the Deh Luran Plain, University of Michigan Memoirs, No. 1, Ann Arbor.

Hurt, W. and O. Blasi

1969 "O projecto arqueologico Lagoa Santa, Minos Gerais, Brazil" Arquivos do Museo Payanaense, Arqueologia, No. 4, Curitiba.

Hurt, W., T. van der Hammen, and G. C. Urrego

1972 "Pre-ceramic sequence in the El Abra Rock-shelter, Colombia," Science, Vol. 175, No. 4026: 1106-1108.

Irwin-Williams, C.

1973 "Summary of Archaeological Evidence from the Valsequillo Region, Puebla, Mexico," IX Congress of Anthro. and Ethno. Sciences, Chicago.

Izumi, S. and K. Terada

1972 Andes 4 - Excavations at Kotosh, Peru, 1963 and 1966, Univ. of Tokyo Press, Tokyo.

Kaplan, L., T. F. Lynch and C. E. Smith, Jr.

1973 "Early Cultivated Beans (Phaseolus vulgaris) from an Intermontane Peruvian Valley," Science, Vol. 179, No. 4068: 76-77.

Kenyon, K. M.

1960 Archaeology in the Holy Land, Praeger, Inc., New York.

Lanning, E.

1967 Peru before the Inca, Prentice-Hall, Inc., Englewood Cliffs.

Lathrap, D. W.

1970 The Upper Amazon, Thames and Hudson, London.

Leroi-Gourhan, A.

1969 "Pollen grains of gramineae and cerealia from Shanidar and Zawi Chemi" in The Domestication and Exploitation of Plants and Animals, edited by P. J. Ucko and G. W. Dimbleby, Aldine Publishing Co., Chicago.

Lynch, T. F.

1967 The nature of Central Andean preceramic, Idaho State University Occasional Papers, No. 21, Pocatello.

1974 "The Antiquity of Man in South America," Quaternary Research, No. 4: 356-377, Seattle.

Lynch, T. F. and K. A. R. Kennedy

1970 "Early Human Cultural and Skeletal Remains from Guitarrero Cave, Northern Peru", Science, Vol. 169, No. 3952: 1307-1309.

MacNeish, R. S.

1954 An Early Archaeological Site Near Panuco, Veracruz, Transactions of the American Philosophical Society, Vol. 44, Pt. 5, Philadelphia.

1964 "Ancient Mesoamerican Civilization," Science, Vol. 143, No. 360: 531-537.

1966 "Speculations about the Beginnings of Village Agriculture in Mesoamerica", Papers of the XXXVI Congreso Internacional de Americanistas, Sevilla.

1972 "The evolution of community patterns in the Tehuacan Valley of Mexico and speculations about the cultural process," in Man, Settlement and Urbanism, Duckworth, London.

MacNeish, R. S., ed.

1975 Excavations and Reconnaissance, The Prehistory of the Tehuacan Valley, Vol. V, University of Texas Press, Austin.

MacNeish, R. S., A. Nelken-Terner and A. Garcia Cook

1970 Second Annual Report of the Ayacucho Archaeological-Botanical Project, R. S. Peabody Foundation for Archaeology, Andover.

Mirambell, L.

1973 El Hombre en Tlapacoya desde hace unos 20 mil anos, Boletin, IHAH, Mexico City.

Murra, J.

1972 "El 'Control Vertical' de un Maximo de Pisos Ecologicos en la Sociedas Andinas," in Vista de la Provincia de Leon de Huanuco by Inigo Ortiz de Zaniga, Universidad Hermilio Valdizan, Huanuco, Peru.

Patterson, T. C.

1971 "Central Peru: Its Population and Economy," Archaeology, New York, Vol. 24, No. 4: 307-315.

Patterson, T. C. and E. P. Lanning

1964 "Changing Settlement Patterns on the Central Peruvian Coast," Nawpa Pacha, No. 2, Berkeley.

Perrot, J.

1962 "Palestine-Syria Cilicia" in Courses toward Urban Life, edited by R. J. Braidwood and G. R. Willey, Aldine Publishing Co., Chicago.

1966 "Le gisement Natufian de Mallaha (Eynan) Israel", Anthropos, No. 70: 437-484, Paris.

Rouse, I, and J. M. Cruxent

1963 Venezuelean Archaeology, Yale University Press, New Haven.

Sanders, D.

1959 "Fluted points from Madden Lake", Panama Archaeologist, 2:39-51, Panama.

Sanders, W. T. and B. J. Price

1968 Mesoamerica, Random House, New York.

Solecki, R. L.

1964 "Zawi Chemi Shanidar, A post-pleistocene village site in Northern Iraq", Report of the VIth International Congress on Quat., Lodz, Poland.

1964a "Shanidar Cave, A Late Pleistocene Site in Northern Iraq," Report of the VIth International Congress on Quat., Lodz, Poland.

Turnbull, P. F. and C. A. Reed

1974 The Fauna from the Terminal Pleistocene of Palegawa Cave, Fieldiana Anthropology, Vol. 63, No. 3, Chicago.

Ucko, P. J., R. Tringham and G. W. Dimbleby

1972 Man, Settlement and Urbanism, Duckworth, London.

Van Loon, M.

1968 "The Oriental Institute Excavations at Mureybit, Syria," Journal of Near Eastern Studies, Vol. 27, No. 4, Chicago.

West, R. C.

1964 "The Natural Regions of Middle America," Handbook of Middle American Indians, Vol. 1, University of Texas Press, Austin.

Willey, G. R.

1966 An Introduction to American Archaeology, Vol. 1, Prentice-Hall, Inc., Englewood Cliffs.

1971 An Introduction to American Archaeology, Vol. 2, Prentice-Hall, Inc., Englewood Cliffs.

Wing, E.

n.d. "The Origins of Agriculture: Animal domestication in the Andes," mimeographed, Florida State Museum, Gainesville.

## PAPERS OF THE SOUTHWEST EXPEDITION

I. An Introduction to Southwestern Archaeology By Alfred V. Kidder. 1924. $20.00.
II. Pueblo Pottery Making. By Carl Guthe. 1925. (out of print)
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IV. The Indians of Pecos Pueblo, a study of their skeletal Remains. By Earnest Albert Hooton, with appendices on the Dentition by Habib J. Rihan and on the Pelves by Edward Reynolds. 1930. (out of print)
V. The Pottery of Pecos. Volume I. Dull Paint Wares. By Alfred Vincent Kidder, together with a section on Black-on-White Wares by Charles Avery Amsden. 1931. (out of print)
VI. The Artifacts of Pecos. By Alfred Vincent Kidder. 1932. $10.00.
VII. The Pottey of Pecos. Volume II. The Glaze Wares By Alfred Vincent Kidder and Anna O. Shephard. 1936. (out of print)

## THE PREHISTORY OF THE TEHUACAN VALLEY

I. Environment and Subsistence. Edited by D.S. Byers. Distributed by the University of Texas Press. 1967. $15.00.
II. The Non-ceramic Artifacts. Edited by D.S. Byers. Distributed by the University of Texas Press. 1967. $12.50.
III. Ceramics. Edited by R.S. MacNeish. Distributed by the University of Texas Press. 1970. $15.00.
IV. Chronology and Irrigation. Edited by Frederick Johnson. Distributed by the University of Texas Press. 1972. $15.00.
V. Excavation and Reconnaissance. Edited by R.S. MacNeish. Distributed by the University of Texas Press. 1975. $29.50.

## PAPERS OF THE ROBERT S. PEABODY FOUNDATION FOR ARCHAEOLOGY

Vol. I, No. 1. Two sites on Martha's Vineyard. By Douglas S. Byers and Frederick Johnson. 1940. $2.00. No. 2. Grassy Island. Archaeological and Botanical Investigations of an Indian Site in the Taunton River, Massachusetts. By Frederick Johnson and Hugh M. Raup. 1947. $4.00.

No. 3. Excavations in Northeastern Massachusetts. By Ripley P. Bullen. 1949. $4.00.

Vol. II. The Boylston Street Fishweir. By Frederick Johnson and others. 1942. $4.00.

Vol. III. Man in Northeastern North America. Edited by Frederick Johnson. 1946. (out of print)

Vol. IV, No. 1. (Complete Vol.) The Boylston Street Fishweir II. A study of the Geology, Palaeobotany, and Biology of a Site on Stuart Street in the Back Bay District of Boston, Massachusetts. By Elso S. Barghoorn, Paul S. Conger, Sheldon Judson, Fred B. Phleger, L. R. Wilson. Edited by Frederick Johnson. 1949. $4.00.

Vol. V. Pecos, New Mexico: Archaeological Notes. By Alfred Vincent Kidder. 1958. $12.50.

Vol. VI. Investigations in the Southwest Yukon: No. 1, Geobotanical and Archaeological Reconnaissance. By Frederick Johnson and Hugh M. Raup. No. 2, Archaeological Excavations, Comparisons and Speculations. By Richard S. MacNeish. 1964. $12.50.

Vol. VII. The Central Peruvian Prehistoric Interaction Sphere. By Richard S. MacNeish, Thomas C. Patterson and David L. Browman. 1975. $6.00

## REPORTS OF THE TEHUACAN PROJECT

First Annual Report of the Tehuacan Archaeological-Botanical Project. By R.S. MacNeish. 1961. (out of print)

Second Annual Report of the Tehuacan Archaeological-Botanical Project. By R.S. MacNeish. 1962. (out of print)

First Annual Report of the Coxcatlan Project. By Edward B. Sisson. 1973. $2.50.

Second Annual Report of the Coxcatlan Project. By Edward B. Sisson. 1974. $2.50.

## REPORTS OF THE AYACUCHO PROJECT

First Annual Report of the Ayacucho Archaeological-Botanical Project. By R.S. MacNeish. 1969. $2.50.

Second Annual Report of the Ayacucho Archaeological-Botanical Project. By R.S. MacNeish, A. Nelken-Terner and A. Garcia C. 1970. $2.50.